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METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 97. JANUARY, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.45, 1st, 10 A.
Minimum reduced to freezing, 28.88, 28th, 2 P.
Reduced† maximum reading, 30.77, 1st, 10 A.
Reduced† min. reading, . . . 29.20, 28th, 2 P.
Mean reduced†, ... 30.041
Monthly range, ... 1.57

****Air Temperature.*** In Degrees Fahr.

Highest, ... 51.0; 5th
Lowest, ... 0., 19th, 20th
Mean, ... 24.2
Mean of means of max. and min., ... 24.7
Mean sensible (wet bulb), ... 23.0
Monthly Range, ... 51.
Highest mean daily, ... 42.1, 5th
Lowest mean daily, ... 5.0, 19th
Mean maximum, ... 32.8
Mean minimum, ... 16.6
Mean daily range, ... 16.2
Greatest daily range, ... 32.0, 20th
Least daily range, ... 6.0, 24th

Humidity.

Mean dew point, ... 18.6
Mean force of vapor, ...147
Mean relative humidity, ... 77.1

Wind.

Prevailing Direction, west.

Summary.

North West, ... 29 per cent.
West, ... 23 " "
South West . . . . . 10 " "
South . . . . . 10 " "
Other directions, ... 28 " "

Total movement, ... 5501 m.
Greatest daily movement, . . . 400 m., 26th
Least daily movement, ... 32m., 14th
Mean daily movement, ... 177.5 m.
Mean hourly velocity, ... 7.4 m.
Maximum pressure per square foot, 18.5 lbs.= 61 m. per hour, 18th 3-30 P. W.

Precipitation. In inches.

Total precipitation, ... 3.00
Number of days on which .01 inch or more rain or melted snow fell, ... 9
Snow total in inches, ... 21.

Weather.

Mean cloudiness observed, . . . 46 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 151 hours or 51 per cent.
Number of clear days, ... 7
Number of fair days, ... 11
Number of cloudy days, ... 13

Bright Sunshine.

Number of Hours recorded, 144 hours or 49%

Rain, 4th, 5th, 17th, 18th, 21st.

Gales, of 35 or more miles per hour, 39m., 6th, W.; 35m., 9th, S.; 35m., 17th, S.; 61m., 18th, W.; 39m., 19th, N.W.; 41m., 22d, W.; 55m., 23d, W.N.W.; 38m., 24th, W.N.W.; 52m., 25th, W.N.W.; 55m., 26th, N.N.W.; 40m., 28th, N.

Snow, 6th, 10th, 11th, 16th, 17th, 18th, 21st, 22d, 27th, 28th.

Days of sleighing, ... 10

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* Temperature in ground shelter.

† Reduced to freezing and sea level.

** Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.77	30.61	30.707	35.	2 P	13.5	6 A	24.2	25.0	24.0	9
2	30.67	30.51	30.565	41.	3 P	29.5	5 A	35.2	34.7	34.2	5
3	30.51	30.31	30.438	43.	2 P	35.	12 P	39.0	38 1	39.0	2
4	30.31	29.77	30.068	50.5	3 P	34.	1 A	42.2	41.5	42.5	0
5	29.77	29.65	29.595	51.	8 A	33.	12 P	42.0	42.1	42.0	3
6	29.91	29.64	29.760	32.	7 A	24.5	9 P	28.2	27.6	25.5	4
7	30.39	29.91	30.255	33.	1 P	21.	12 P	27.0	26.7	23.5	4
8	30.46	30.31	30.374	31.5	3 P	14.	6 A	22.7	20.2	19.7	9
9	30.31	29.91	30.096	36.5	2 P	11.	7 A	23.7	23.1	22.0	9
10	29.91	29.77	29.810	38.	11 A	25.5	1 A	31.7	34.0	30.8	0
11	29.81	29.67	29.725	34.5	2 P	24.	12 P	29.2	28.9	27.0	0
12	30.18	29.73	29.941	21.	1 A	7.	12 P	14.0	16 4	12.8	6
13	30.33	30.18	30.281	27.	2 P	1.	7 A	14.0	11.8	11.3	7
14	30.29	30.23	30.255	24.	2 P	9.	3 A	16.5	17.8	17.7	0
15	30.28	30.19	30.229	32.	2 P	19.	4 A	25.5	25.2	24.7	2
16	30.24	30.16	30.204	37.5	2 P	26.5	12 P	32.0	29 7	29.3	2
17	30.27	29.77	30.068	45.	12 P	17.	6 A	31.0	28.6	30.2	0
18	29.96	29.45	29.666	45.	7 A	18.	12 P	31.5	32.0	28.7	5
19	30.52	29.96	30.376	9.5	1 A	0.	7 A	4.7	5.0	2.0	9
20	30.57	30.31	30.445	32.	3 P	0.	6 A	16.0	10.7	11.2	5
21	30.31	29.50	29.603	41.	2 P	17.	2 A	29.0	32.7	34.7	1
22	29.75	29.48	29.648	37.	2 P	28.5	7 A	32.7	32.6	30.0	7
23	29.90	29.15	29.673	31.	2 P	25.	12 P	28.0	25.9	23.5	7
24	29.91	29.75	29.825	21.	2 P	15.	12 P	18.0	15.3	13.2	0
25	29.81	29.56	29.718	19.	3 P	1.	4 A	10.0	7.3	6.8	7
26	29.77	29.52	29.638	27.	12 M	10.	1 A	18.5	20 2	19.0	8
27	29.94	27.77	29.870	27.	2 P	14.	6 A	20 5	21.3	21.2	3
28	29.77	29.20	29.348	25.	7 A	18.5	12 P	21.7	22.4	21.8	0
29	30.19	29.47	29.950	26.5	2 P	18.	12 P	22.2	20.6	19.0	10
30	30.60	30.19	30.438	32.	3 P	2.5	7 A	17.2	16.7	14.5	10
31	30 71	30. 0	30 6 8	32.5	3 P	[illegible]	A	16.7	15.0	12.7	10

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DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.				PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	TOTAL IN INCHES. SNOW.
1	19.0	.150	76.7	W.	147	0.	0	———				
2	32.0	.208	88.3	S.	176	2.5	22	2 P				
3	38.3	.243	96.0	S.	176	0.	0	———				
4	42.3	.275	100.	S.	43	0.	0	———	6 P	12 P	0.22	
5	41.0	.278	96.7	S.W.	79	0.	0	———	0 A	2 P	0.44	
6	20.7	.150	77.3	S.W.	149	7.5	39	12 M	7-30 A	11 A	.T	T.
7	17.7	.141	73.3	W.N.W	207	3.	24	12 M				
8	16.0	.119	82.7	N.	164	1.	14	11 A				
9	17.0	.140	76.7	W.S W.	115	6.	35	12 P				
10	25.0	.196	71.3	W.	245	3.5	26	1-30 A	10 A			T.
11	22.7	.162	77.3	S.W.	122	0.	0	———	3 P	4 P		T.
12	2.0	.094	54.7	W.	218	4.5	30	10 A				
13	4.0	.089	68.7	W.	132	1.	14	1-30 A				
14	12.0	.109	72.7	N.W.	32	0.	0	———				
15	20.3	.147	77.0	N.N.W.	118	0.5	10	5 A				
16	26.0	.176	84.7	S.S.W.	67	0.75	13	1 P	7 A			T.
17	29.0	.181	92.7	S.S.W.	144	6.	35	3-30 P	12 M	12 P	T.	T.
18	21.7	.189	69.0	W.S W	357	18 5	61	3-30 P	0 A	11 A	0.43	T.
19	−11.	.055	51.0	N.W.	309	7.5	39	1-30 A				
20	7.7	.083	84.0	S.E.	65	0.5	10	12-30 P	5-30 P	12 P	* *	
21	31.	.218	83.0	N.W.	147	3.5	26	8 P	0 A	12 M	1.00	5.5
22	24.3	.186	75.0	W.	208	8 5	41	10-30 A	6 P	11 P	0.03	0.5
23	18.0	.141	73.0	N.W.	252	15.	55	2-15 P				
24	4.3	.092	62.3	W.	194	7.	38	9 P				
25	−1.3	.068	63.7	W.N.W	332	13.5	52	10-30 A				
26	11.3	.117	66.3	N.W.	400	15.	55	7 A				
27	17.3	.126	81.0	N.W.	92	1.	14	6 A	9-30 P	12 P		1.0
28	19.7	.123	90.0	N.W.	328	8.	40	10-30 A	0 A	5 P	0.88	14.0
29	11.7	.117	66.7	N.W.	275	5.5	33	5-30 A				
30	10.3	.102	80.3	N.W.	110	5.5	33	12 P				
31	7.3	.096	78.3	W.	98	4.	28	2 A				

*At base of tower. T=trace. * * Included in 21st.

APR 21 1914

REMARKS.

The weather of the first three weeks of January was decidedly warmer and brighter than usual, barring two short cold waves, while the closing days of the month witnessed a protracted cold wave, accompanied on the 28th inst. by one of the worst blizzards that has occurred for several years.

The cold wave set in on the night of the 23d instant and continued throughout the month giving mean daily temperatures varying from one-half to fifteen and a half degrees below the normal for January at this station. On the morning of the 25th. instant the minimum temperature, 1° F., was reached, after which the cold moderated somewhat, though the wind continued to blow a gale until the 27th instant. About half past nine o'clock on the evening of that day snow began falling very gently, so that not more than an inch fell before midnight; but shortly after this time the storm increased in violence. By eight o'clock in the morning from ten to twelve inches of snow lay on the ground and it continued to snow heavily until five o'clock in the afternoon, when, with about fifteen inches of snow on the ground it ceased snowing, but continued to drift badly, as the snow was very fine and dry and a strong wind was blowing from the northwest.

From that time (Jan. 28) to the close of the month the weather continued so cold even during the middle of the day, that the snow failed to pack well and sleighing wast herefore not at its best. In spite of this protracted cold wave, however, the mean daily temperature for the month was two and a half degrees above normal.

The unusually high "total wind movement" and the large amount of sunshine should also be noted.

LEONARD METCALF, Mereorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 98. FEBRUARY, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.38, 38th, 12 P.
Minimum reduced to freezing, 29.23, 23d, 7 A.
Reduced† maximum reading, 30.70, 28th, 12 P.
Reduced† min. reading, . . . 29.55, 23d, 7 A.
Mean reduced†, ... 30.056
Monthly range, ... 1.15

**Air Temperature.* In Degrees Fahr.

Highest, ... 48.0; 21st
Lowest, ... -11., 1st
Mean, ... 25.1
Mean of means of max. and min., ... 25.4
Mean sensible (wet bulb), ... 23.5
Monthly Range, ... 59.
Highest mean daily, ... 39.2, 7th
Lowest mean daily, ... 6.8, 1st
Mean maximum, ... 35.0
Mean minimum, ... 15.9
Mean daily range, ... 19.1
Greatest daily range, ... 42.0, 5th, 14th
Least daily range, ... 5.0, 12th

Humidity.

Mean dew point, ... 18.1
Mean force of vapor, ...151
Mean relative humidity, ... 75.7

Wind.

Prevailing Direction, West North West.

Summary.

North West, ... 14 per cent.
West . . . . . 11 " "
West North West . . . . . 11 " "
North, ... 14 " "
South . . . . . 21 " "
Other directions, ... 29 " "

Total movement, ... 4493 m.
Greatest daily movement, ... 400 m., 3d
Least daily movement, ... 11m., 1st
Mean daily movement, ... 160.5 m.
Mean hourly velocity, ... 6.7 m.
Maximum pressure per square foot, 10.0 lbs.= 45 m. per hour, 10 A. 3d, N.N.E.

Precipitation. In inches.

Total precipitation, ... 2.52
Number of days on which .01 inch or more rain or melted snow fell, ... 9
Snow total in inches, ... 13.

Weather.

Mean cloudiness observed, . . . 51 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 218 hours or 59 per cent.
Number of clear days, ... 10
Number of fair days, ... 6
Number of cloudy days, ... 12

Bright Sunshine.

Number of Hours recorded, 154 hours or 41%

Rain, 6th, 7th, 21st, 22d, 23d.

Gales, of 35 or more miles per hour, 45m., 3d, N.N.E.; 44m., 6th, E.; 39m., 18th, W.N.W.; 40m., 19th, N.W.; 36m., 21st, W.N.W.; 38m., 24th, W.; 35m., 28th, S.W.

Snow, 8th, 12th, 15th, 16th, 19th, 20th, 21st, 22d, 23d.

Days of sleighing, for heavy sleighs, . . 18
for light sleighs, ... 28

* Temperature in ground shelter.
† Reduced to freezing and sea level.
* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.65	30.22	30.418	30.	3 P	-11.	7 A	9.5	6.8	6.2	10
2	30.22	29.83	29.950	34.5	3 P	-1.	2 A	16.8	19.1	20.0	4
3	30.04	29.81	29.884	33.	3 P	25.	12 P	29.0	28.9	25.5	0
4	30.38	30.01	30.259	34.	3 P	14.	12 P	24.0	21.2	17.8	5
5	30.52	30.38	30.460	38.	4 P	-4.	6 A	17.0	13.1	13.2	10
6	30.43	29.79	30.118	43.	12 P	15.	3 A	29.0	29.3	29.3	0
7	29.79	29.60	29.658	42.	4 A	36.5	12 P	39.2	39.2	38.2	0
8	29.90	29.78	29.837	41.	12 M	28.	6 A	34.5	34.5	31.8	4
9	30.11	29.84	30.012	40.5	1 P	27.5	3 A	34.0	32.1	30.0	8
10	30.27	30.11	30.192	35.	3 P	21.	12 P	28.0	28.7	25.3	7
11	30.33	30.21	30.246	28.	3 P	8.	8 A	18.0	16.5	14.0	10
12	30.21	29.73	29.867	15.	4 P	10.	7 A	12.5	12.3	12.7	0
13	30.20	29.81	30.103	29.	3 P	2.5	12 P	15.7	14.7	12.0	10
14	30.20	29.92	30.027	35.	3 P	-7.	6 A	14.0	14.1	14.7	10
15	29.98	29.80	29.915	37.	1 P	15.5	4 A	26.2	30.6	29.5	0
16	29.87	29.66	29.732	40.	5 P	28.	6 A	34.0	31.6	30.0	3
17	30.01	29.77	29.886	40.	3 P	19.	5 A	29.5	31.5	31.5	1
18	29.97	29.72	29.868	41.5	2 P	32.	6 A	36.7	36.4	33.2	8
19	30.31	29.97	30.124	33.5	1 P	23.	12 P	28.2	28.5	24.3	9
20	30.40	30.01	30.273	35.	3 P	14.5	6 A	24.7	25.6	23.3	6
21	30.01	29.72	29.813	48.	3 P	25.5	1 A	36.7	36.7	35.2	9
22	30.10	29.82	30.014	33.5	1 A	28.	8 A	30.7	31.2	29.8	0
23	29.83	29.55	29.670	41.	3 P	29.	12 P	35.0	32.6	31.3	1
24	30.23	29.82	30.125	31.5	3 P	23.5	12 P	27.5	26.1	23.5	8
25	30.23	29.94	30.036	36.5	2 P	14.5	7 A	25.5	26.7	26.3	0
26	30.29	29.96	30.169	33.	3 P	16.5	12 P	24.7	22.8	19.7	10
27	30.44	30.29	30.411	25.	4 P	5.	6 A	15.0	16.0	14.3	11
28	30.70	30.43	30.516	27.	2 P	7.	3 A	17.0	16.6	16.0	10

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	3.0	.074	86.0	S.	11	0.	0	———				
2	13.7	.134	73.0	N.N.W	66	2.	20	12 P				
3	12.7	.158	62.0	N.	400	10.	45	10 A				
4	10.7	.118	66.3	N.	203	1.	14	2 P				
5	10.0	.100	83.7	S.	20	0.	0	———				
6	24.3	.189	75.0	N.E.	129	9.5	44	5 P	10 P	12 P	* *	
7	36.7	.239	91.7	S.	229	5.	32	1-30 A	0 A	4 P	0.61	
8	28.7	.192	84.7	W.	79	1.	14	2 A	6-30 P	12 P	0.08	1.''
9	24.7	.186	74.3	N.W.	180	4.	29	1-30 P				
10	16.7	.160	65.3	W.N.W	164	3.	25	10 A				
11	6.0	.099	63.0	N.	212	1.5	18	4-30 A				
12	12.3	.080	100.	N.	223	1.	14	1-30 A	4 A	11 P	0.66	7.
13	5.3	.092	70.0	N.W.	103	0.	0	———				
14	11.7	.107	85.7	S.S.W.	71	0.	0	———				
15	25.3	.178	80.7	S.W.	83	3.	25	8-30 P	8 P	12 P	* *	
16	26.3	.180	83.3	N.N.W	89	2.	20	4 P	0 A	7 A	0.11	1.
17	27.7	.198	81.0	S.	198	5.	32	12 M				
18	25.7	.222	65.0	W.N.W	232	7.5	39	3-30 P				
19	18.0	.149	68.0	N.W.	237	8.	40	2 P	10-15 A			T.
20	17.7	.143	73.0	S.	168	2.	20	10 P	9 P	12 P	* *	
21	30.0	.237	75.7	W.S.W	234	6.5	36	1 P	0 A	5 A	0.14	2.''
22	25.3	.179	79.3	N.E.	186	3.5	26	6 A	11 A	12 P	* *	
23	26.0	.198	74.3	W.N.W	173	3.5	26	4-30 P	0 A	4 P	0.92	2.
24	18.0	.141	73.0	W.	209	7.	38	2 P				
25	23.3	.159	86.3	S.	186	3.	25	2 P				
26	11.7	.125	63.7	N.W.	118	0.5	10	7 A				
27	8.3	.096	74.7	W.	129	3.	25	12 M				
28	7.7	.107	62.0	W.S.W	161	6.	35	1 P				

*At base of tower. T=trace. ** Included in following day..

REMARKS.

The weather of the past month was normal in almost every respect, though slightly milder and drier, and considerably less windy than usual.

We regret to inform our readers that an error in the constants for reduction of barometer readings to freezing and sea-level at this station, necessitating the recomputation of our barometer readings taken prior to December 1896, was recently discovered by us. We append below the corrected readings for 1896. These it will be noticed are unfortunately broken, from the middle of February to the middle of April so that the average for the year is based on the corrected readings for ten months.

1896.	Maximum.*	Minimum.*	Mean.*
January,	30.56	29.59	30.158
February,	30.49	28.72	29.811* *
March,	——	——	——
April,	——	——	30.095* * *
May,	30.41	29.67	29.984
June,	30.33	29.49	29.949
July,	30.38	29.57	29.974
August,	30.32	29.69	29.989
September,	30.36	29.46	30.004
October,	30.62	29.52	30.011
November,	30.83	29.52	30.145
December,	30.94	29.37	30.135
For the year,	30.94 †	28.72 † †	30.030

* Reduced to freezing and sea-level.
* * First 18 days of month.
* * * Last 13 days of month.
† Dec. 27th, 12 P.
† † Feb. 6th, 11-30 P.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No 99. MARCH, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, . 30.54, 1st, 7A.
Minimum reduced to freezing, 28.84, 25th, 3 A.
Reduced† maximum reading, 30.88, 1st, 7 A.
Reduced† min. reading, . . . 29.14, 25th, 3 A.
Mean reduced†, ... 30.036
Monthly range, ... 1.74

**Air Temperature.* In Degrees Fahr.

Highest, ... 59.0; 23d
Lowest, ... -1.5, 1st
Mean, ... 32.9
Mean of means of max. and min., ... 33.1
Mean sensible (wet bulb), ... 31.1
Monthly Range, ... 60.5
Highest mean daily, ... 45.6, 23d
Lowest mean daily, ... 10.8, 1st
Mean maximum, ... 42.3
Mean minimum, ... 24.0
Mean daily range, ... 18.3
Greatest daily range, ... 39.0, 1st
Least daily range, ... 5.5, 20th, 25th

Humidity.

Mean dew point, ... 26.9
Mean force of vapor, ...204
Mean relative humidity, ... 78.9

Wind.

Prevailing Direction, West North West.

Summary.

North West, ...	10	per cent.
West, ...	10	" "
West North West	26	" "
West South West, ...	13	" "
North, ...	10	" "
North North East, ...	10	" "
South	10	" "
Other directions.	11	" "

Total movement, ... 5363 m.
Greatest daily movement, . . . 343 m., 15th
Least daily movement, ... 49m., 8th
Mean daily movement, ... 173.0 m.
Mean hourly velocity, ... 7.2 m.
Maximum pressure per square foot, 13.5 lbs.= 52 m. per hour, 11 A. 15th, W.N.W. ; 4 P. 25th W.

Precipitation. In inches.

Total precipitation, ... 3.53
Number of days on which .01 inch or more rain or melted snow fell, ... 12
Snow total in inches, ... 5.

Weather.

Mean cloudiness observed, . . . 56 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 184 hours or 49 per cent.
Number of clear days, ... 12
Number of fair days, ... 4
Number of cloudy days, ... 15

Bright Sunshine.

Number of Hours recorded, 188 hours or 51%

Rain, 3d, 5th, 9th, 10th 12th, 20th, 21st, 23d, 24th.

Gales, of 35 or more miles per hour, 47m., 3d, N.W.; 51m., 4th, N.W.; 42m., 6th, W.N.W.; 35m., 10th, N.W.; 48m., 11th, W.S.W.; 51m., 13th, W.N.W.; 40m., 14th, W.N.W.; 52m., 15th, W.N.W ; 36m., 21st, W.N.W.; 38m., 22d, S.; 52m., 25th, W.; 35m., 26th, W.N.W.

Snow, 1st, 2nd, 5th, 14th, 20th, 24th, 25th, 26th, 27th.

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* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.& MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.88	30.23	30.666	37.5	12 P	−1.5	7 A	18.0	10.8	9.2	4
2	30.27	30.14	30.204	45.5	1 P	14.5	1 A	30.0	37.2	36.0	2
3	30.22	29.71	29.858	42.	7 P	32.	5 A	37.0	34.8	35.2	0
4	30.43	29.88	30.265	33.	2 P	25.	12 P	29.0	28.1	24.7	11
5	30.44	29.82	30.125	45.	12 P	16.5	4 A	30.7	27.0	27.8	0
6	30.55	29.82	30.225	44.5	10 A	26.	12 P	35.2	35.9	32.2	4
7	30.73	30.55	30.691	30.	4 P	11.	6 A	20.5	20.7	19.3	12
8	30.67	30.33	30.502	37.	5 P	9.5	6 A	23.2	24.5	23.7	11
9	30.33	29.91	30.088	39.	2 P	31.	5 A	35.0	34.7	35.3	0
10	29.91	29.59	29.717	48.	3 P	33.	2 A	40.5	37.8	38.3	4
11	30.07	29.89	29.991	50.	3 P	28.5	5 A	39.2	39.7	36.8	10
12	30.05	29.55	29.710	45.	12 M	29.	2 A	37.0	35 3	34.3	0
13	30.33	29.64	30.134	32.5	1 A	24.	12 P	28.2	28.2	23.7	12
14	30.35	29.86	30.024	33.	11 P	18.	6 A	25.5	22.9	22.8	2
15	30.35	30.01	30.266	31.5	2 P	24.	12 P	27.7	27.6	25.3	11
16	30.57	30.35	30.506	25.	4 P	16.	12 P	20.5	18.6	16.7	12
17	30.57	30.26	30.388	36.	5 P	2.5	6 A	19.2	20.9	19.5	12
18	30.26	29.91	30.067	42.	2 P	18.	5 A	30.0	31.0	30.7	7
19	29.91	29.63	29.730	58.	3 P	34.	6 A	46.0	43.6	43.2	7
20	29.80	29.61	29.649	38.5	1 A	33.	12 P	35.7	36.5	35.3	0
21	29.98	29.80	29.876	49.	3 P	32.	6 A	40.5	39.4	37.3	4
22	30.05	29.80	29.919	53.	4 P	30.	6 A	41.5	43.2	40.8	5
23	29.84	29.67	29.747	59.	4 P	35.5	5 A	47.2	45.6	42.7	11
24	29.67	29.15	29.264	37.5	1 A	31.5	3 P	34.5	34.7	34.0	0
25	29.42	29.14	29.281	38.	3 P	32.5	11 P	35.2	34.8	33.7	0
26	29.76	29.42	29.591	40.5	1 P	31.5	3 A	36.0	35 0	32.5	0
27	29.93	29.76	29.819	40.5	1 P	22.	4 A	31.2	34.9	32.2	2
28	30.19	29.93	30.073	47.	3 P	28.	4 A	37.5	37.4	33.8	9
29	30.26	30.19	30.247	52.	5 P	26.	5 A	39.0	38.7	34.7	12
30	30.28	30.12	30.214	51.	5 P	25.5	6 A	38.2	40.5	36.2	12
31	30.35	30.19	30.266	51.	3 P	26.	5 A	38 5	38.7	33.8	12

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	TOTAL IN INCHES. SNOW.
1	4.7	.075	82.0	W.N.W	66	1.	14	12 P	3 P	12 P		
2	32.7	.231	84.3	W.S.W	172	3.5	26	1 A	0 A	12 P	0.30	2.
3	33.7	.213	91.7	W.	106	11.	47	11 P	0 A	4 P	0.22	
4	17.3	.153	66.0	W.N.W	336	13.	51	1 A				
5	26.3	.158	95.0	S.	122	3.	25	10 A	10 A	9 P	0.69	T.
6	24.7	.220	63.7	N.N.W	312	9.	42	7-30 A				
7	14.3	.119	75.0	N.	257	5.5	33	1 A				
8	20.7	.144	83.7	W.S.W	49	0.5	10	10 P				
9	34.5	.211	94.0	S.	200	1.5	17	2 A	8-30 P	12 P	0.03	
10	37.0	.245	91.7	W S.W	154	6.	35	6 P	0 A	3 P	0.19	
11	29.3	.269	62.3	S.W.	179	11.5	48	1-30 P				
12	33.7	.201	96.7	W S.W	76	4.	28	9 A	8 A	4 P	0.17	
13	17.7	.143	71.0	N W.	320	13.	51	8 A				
14	21.7	.126	95.0	N.W.	102	8.	40	11 P	9 A	4 P	0.41	3.
15	20.7	.151	76.3	W.N W	343	13.5	52	11 A				
16	9.7	.105	68.0	N.W.	271	4.5	30	10 A				
17	14.3	.126	76.0	W.	79	0.5	10	3 P				
18	26.3	.196	82.0	S.W.	70	0.5	10	9 P				
19	40.3	.322	83.3	S.S E.	85	0.	0	0				
20	35.0	.208	97.0	N.N.E.	137	1.	14	7 P	0 A	7 P	0.81	T.
21	33.0	.255	77.7	W.	97	6.5	36	4 P	1-30 P	3 P	0.01	
22	38.3	.283	84.0	S	119	7.	38	4 P				
23	37.3	.336	73.0	N N.E.	133	1.	14	10-30 A	11 P	12 P	0.07	
24	32.3	.200	93.7	N.N.E.	143	1.	14	10 A	0 A	7 P	0.63	T.
25	30.7	.206	84.7	W.	320	13.5	52	4 P	10 A			T.
26	28.3	.204	77.0	W.N.W	238	6.	35	12 M	6 P			T.
27	26.0	.207	71.7	W.N.W	142	1.5	17	10 A	11 A			T.
28	26.3	.232	65.7	W.N.W	230	5.5	33	12M				
29	26.3	.253	61.3	W.N.W	139	2.	20	2 P				
30	37.3	.278	64 0	W.N.W	138	3.5	26	2 P				
31	23.7	.251	57.0	N.	228	6.	35	3 P				

*At base of tower. T=trace. ** Included in following day..

REMARKS.

Little need be said in comment on the weather of the past month, as it was a normal March.

While the range of temperature was very large, the average for the month was nearly normal, (about a degree above the mean) the temperature of the first eighteen days of the month being generally below, while that of the last two weeks was from $2\frac{1}{2}^\circ$ to $13\frac{1}{2}^\circ$ above it.

The frost is already well out of the ground in this vicinity, except in some isolated spots, and the season is from ten days to two weeks earlier than last year.

The bluebirds, robins, blackbirds, meadow larks and song sparrows were seen in Amherst by the writer from ten days to two weeks earlier this year than last.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 100. APRIL, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.30, 13th, 7 A.	
Minimum reduced to freezing, 29.22, 26th, 5 P.	
Reduced† maximum reading, 30.61, 13th, 7 A.	
Reduced† min. reading,	29.51, 26th, 5 P.
Mean reduced†,	30.042
Monthly range,	1.10

****Air Temperature.*** In Degrees Fahr.

Highest,	80.5; 25th
Lowest,	20.5, 20th
Mean,	46.5
Mean of means of max. and min.,	47.0
Mean sensible (wet bulb),	42.2
Monthly Range,	60.0
Highest mean daily,	62.7, 25th
Lowest mean daily,	30.5, 20th
Mean maximum,	59.4
Mean minimum,	34.7
Mean daily range,	24.7
Greatest daily range,	43.5, 29th
Least daily range,	4.5, 9th

Humidity.

Mean dew point,	35.7
Mean force of vapor,	.356
Mean relative humidity,	68.2

Wind.

Prevailing Direction, West.

Summary.

South West,	10 per cent.
West,	10 " "
West South West,	10 " "
North,	10 " "
North North West,	13 " "
South	17 " "
Other directions,	30 " "

Total movement,	5523 m.
Greatest daily movement,	380 m., 19th
Least daily movement,	57m., 8th
Mean daily movement,	184.1 m.
Mean hourly velocity,	7.7 m.
Maximum pressure per square foot, 14.0 lbs.= 53 m. per hour, 6-30 P. M. 19th, N.W.	

Precipitation. In inches.

Total precipitation,	2.42
Number of days on which .01 inch or more rain or melted snow fell,	10
Snow total in inches,	T.

Weather.

Mean cloudiness observed,	46 per cent.
Total cloudiness recorded by the Sun Thermometer,	164 hours or 49 per cent.
Number of clear days,	13
Number of fair days,	5
Number of cloudy days,	12

Bright Sunshine.

Number of Hours recorded, 239 hours or 59%

Rain, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 14th, 15th, 17th, 19th, 26th, 28th.

Gales, of 35 or more miles per hour, 43m., 13th, S.S.W.; 46m., 17th, N.W.; 53m., 19th, N.W.; 35m., 20th, N.W.; 38m., 25th, S.W.; 47m., 26th, S.S.W.; 40m., 27th, N.W.

Snow, 27th.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.								NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAP'ER.	MEAN SENSIBLE.	WET BULB.	
1	30.46	30.22	30.362	52.5	4 P	26.	5 A	39.2	40.0	34.8		13
2	30.22	29.98	30.093	62.	3 P	25.5	3 A	43.7	45.6	38.5		13
3	30.45	30.19	30.408	49.	4 P	29.	6 A	39.0	38.3	33.3		13
4	30.44	30.06	30.274	55.	3 P	22.	6 A	38.5	38.5	35.8		6
5	30.06	29.67	29.751	63.5	3 P	36.5	5 A	50.0	48.6	47.8		4
6	29.83	29.64	29.696	60.5	3 P	46.5	12 P	53.5	50.8	47.3		3
7	30.01	29.83	29.960	54.5	3 P	34.5	6 A	44.5	45.5	43.7		5
8	30.10	30.01	30.060	54.	3 P	38.	6 A	46.0	46.3	43.8		4
9	30.01	29.66	29.758	41.	1 A	36.5	12 P	38.7	39.7	39.0		0
10	30.06	29.68	29.896	48.	1 P	35.5	6 A	41.7	39.3	37.7		3
11	30.21	30.00	30.058	49.	4 P	33.	12 P	41.0	38.5	34.2		3
12	30.57	30.21	30.456	57.	3 P	25.	6 A	41.0	40.9	35.7		12
13	30.61	30.18	30.420	55.	1 P	26.5	6 A	40.7	43.1	39.3		7
14	30.18	29.89	29.974	68.	3 P	45.5	6 A	56.7	54.5	50.7		3
15	30.00	29.66	29.797	48.5	2 P	43.5	12 P	46.0	44.8	44.3		0
16	29.88	29.79	29.856	63.	4 P	36.5	6 A	49.7	50.1	45.2		13
17	29.87	29.71	29.783	55.	3 P	40.	6 A	47.5	43.7	41.7		4
18	30.12	29.87	30.064	58.	4 P	37.5	5 A	47.7	47.8	41.0		13
19	30.21	29.83	30.020	62.5	1 P	28.	12 P	45.2	44.7	36.7		8
20	30.51	30.21	30.468	40.	5 P	20.5	6 A	30.2	30.5	27.3		14
21	30.59	30.47	30.519	56.5	4 P	21.	5 A	38.7	40.0	35.7		14
22	30.53	30.35	30.427	67.5	2 P	31.5	5 A	49.5	49.1	44.7		11
23	30.37	30.13	30.210	77.	3 P	40.	5 A	58.5	57.0	50.5		12
24	30.19	30.00	30.056	79.5	3 P	46.	5 A	62.7	61.5	55.5		9
25	30.06	29.69	29.803	80.5	3 P	46.5	5 A	63.5	62.7	57.0		9
26	29.77	29.51	29.652	68.	4 P	47.	12 P	57.5	55.8	47.3		12
27	29.70	29.58	29.673	47.	12 M	32.	6 A	39.5	38.7	34.5		0
28	30.00	29.69	29.913	55.	3 P	36.5	12 P	45.7	44.4	41.5		5
29	29.99	29.78	29 877	72.	3 P	28.5	6 A	50.2	53.0	46.8		14
30	30.01	29.91	29.971	80.	4 P	44.	5 A	62.0	62.3	55.2		12

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	TOTAL IN INCHES. SNOW.
1	24.3	.262	56.7	N.N. W	221	3.5	26	10 A				
2	26.3	.342	47.7	W.N.W	173	5.	32	1 P				
3	24.3	.238	59.7	N.	204	2.5	22	10-30 A				
4	30.3	.266	73.0	S.	159	4.5	30	4 P	10-30 P	12 P	0.05	
5	45.7	.382	72.3	S.	152	1.5	17	2-30 P	0 A	7 A	0.17	
6	43.7	.377	79.3	W.S.W	108	2.5	22	6 P	6 P	8-30 P	0.07	
7	39.7	.326	77.0	N.N.W	77	0.5	10	12 M	6 P	12 P	0.11	
8	40.7	.320	83.3	S.W.	57	0.5	10	9 P	0 A	12 P	0.29	
9	38.7	.241	97.0	N.N.E.	187	1.5	17	9 P	0 A	8-30 P	1.26	
10	35.0	.245	84.3	W.N.W	120	3.	25	1-30 P	7 A		T.	
11	28 0	.231	68.3	N.N.W	204	3.	25	12 M				
12	27.0	.279	59.3	N.N.W	90	1.5	17	1 P				
13	33.0	.305	67.7	S.	171	9.	43	4 P				
14	46.3	.453	76.0	S.W.	281	4.	28	1 P	7 A	4 P	0.04	
15	43.7	.299	95.0	N.W.	123	2.5	22	12 P	0 A	5 P	0.35	
16	37.7	.396	60.7	W.S.W	181	3.5	26	0 A				
17	38.7	.294	81.0	W.	111	10.5	46	4 P	4 A	1 P	T.	
18	32.0	.340	55.3	W S.W	211	3.	25	12 M				
19	25.7	.302	60.0	S.W.	380	14.	53	6-30 P	1 P		T.	
20	22.0	.170	72.7	W.	365	6.	35	8 A				
21	25.7	.277	54.3	S.	81	1.	14	4 P				
22	38.7	.407	66.3	S.S.E.	185	3.5	26	8 P				
23	42.0	.546	58.3	S.	237	4.	28	4 P				
24	49.3	.625	63.0	S.S.W.	135	1.	14	9 P				
25	52.0	.646	65.7	S.S.W.	220	7.	38	4 P				
26	36.7	.471	55.0	W.	197	11.	47	6 P	3 A	10 P	0.04	
27	28.3	.231	67.7	N.W.	321	8.	40	11 A	10 A			T.
28	37.0	.309	73.3	N.	287	5.5	33	11-30 A	6 A	1 P	0.04	
29	38.0	.484	58.7	N.	181	5.	32	2 P				
30	48.0	.625	57.7	N.E.	104	3.5	27	8 A				

*At base of tower. T=trace. ** Included in following day..

REMARKS.

The records of the past month show an excess of wind, high relative humidity, normal temperature, and large amount of sunshine.

While the mean daily temperature varied less than one-half of a degree from the normal there have been several noteworthy departures from the generally equitable temperature during the month. After the first four days of the month, which were cool, there came a week of very warm springlike weather; then three days of cool, and thereafter with two notable exceptions warm weather, reaching a maximum of 80.5° on the 25th. instant. The two exceptions referred to were the 20th. and 27th. instants on which the temperature fell to 23° and to 32° F. respectively. Coming as they did between very warm weather, these two days proved very trying ones and it was feared that the fruit-trees might be seriously affected by the freeze.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 101. MAY, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.05, 8th, 10A.
Minimum reduced to freezing, 29.32, 10th, 4 P.
Reduced† maximum reading, 30.36, 8th, 10 A.
Reduced† min. reading, . . . 29.60, 10th, 4 P.
Mean reduced†, ... 29.924
Monthly range, ... 0.76

Air Temperature. In Degrees Fahr.

Highest, ... 79.5; 10th
Lowest, ... 31.5, 8th
Mean, ... 57.1 † †
Mean of means of max. and min., ... 56.7
Mean sensible (wet bulb), ... 52.4
Monthly Range, ... 48.0
Highest mean daily, ...
Lowest mean daily, ... 46.9, 2d
Mean maximum, ... 67.6
Mean minimum, ... 45.9
Mean daily range, ... 21.7
Greatest daily range, ... 40.0, 9th
Least daily range, ... 7.5, 2d

Humidity.

Mean dew point, ... 48.0
Mean force of vapor, ...496
Mean relative humidity, ... 71.5

Wind.

Prevailing Direction, West.

Summary.

North West, ... 10 per cent.
West, ... 10 " "
North, ... 10 " "
North North West, ... 16 " "
South . . . . . 26 " "
Other directions, ... 28 " "

Total movement, ... 5603 m.
Greatest daily movement, . . . 307 m., 20th.
Least daily movement, ... 81m., 28th.
Mean daily movement, ... 180.7 m.
Mean hourly velocity, ... 7.5 m.
Maximum pressure per square foot, 22.0 lbs.= 66 m. per hour, 2 P. M. 10th, W.S.W.

Precipitation. In inches.

Total precipitation, ... 4.38
Number of days on which .01 inch or more rain or melted snow fell, ... 14

Weather.

Mean cloudiness observed, . . . 47 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 217.5 hours or 48 per cent.
Number of clear days, ... 11
Number of fair days, ... 11
Number of cloudy days, ... 9

Bright Sunshine.

Number of Hours recorded, 236 hours or 52%
Rain, 1st, 2d, 3d, 4th, 10th, 12th, 13th, 15th, 21st, 24th, 25th, 27th, 28th, 31st.
Last Frost, ... 8th.
Gales, of 35 or more miles per hour, 35m., 6th, N.N.E.; 36m., 7th, N.; 66m., 10th, W.S.W.; 39m., 13th, S.S.W.; 40m., 20th, S.S.W.; 42m., 23d, S.S.W.; 40m., 26th, N. 36m., 30th, S.
Thunder and Lightning, ... 10th.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

† † Mean of tri-daily readings. Draper Thermometer record broken for several days.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.14	30.01	30.111	56.	10 A	46.	12 P	51.0	52.1	48.8	0
2	30.07	29.79	29.860	51.	3 P	43.5	1 A	47.2	46.9	46.0	0
3	29.80	29.78	29.789	64.	4 P	43.	5 A	53.5	52.0	51.0	2
4	29.92	29.78	29.856	64.	4 P	47.	5 A	55.5	53.3	49.7	7
5	29.96	29.85	29.902	74.	4 P	36.5	6 A	55.2	58.0	51.8	13
6	30.02	29.90	29.954	71.	3 P	52.	12 P	61.5	60.8	50.5	14
7	30.21	29.97	30.057	64.	1 P	44.	12 P	54.0	52.6	42.7	12
8	30.36	30.21	30.262	63.5	3 P	31.5	5 A	47.5	48.1	42.7	14
9	30.21	29.80	29.926	79.	3 P	39.	5 A	59.0	60.1	53.2	13
10	29.80	29.60	29.707	79.5		55.5		67.5		60.0	9
11	29.95	29.81	29.916	75.		44.5		59.7		56.8	12
12	29.97	29.77	29.829	66.		52.5		59.2		58.2	0
13	29.85	29.66	29.779	64.5		47.5		56.0		60.2	0
14	29.91	29.78	29.836	73.5		49.		61.2		59.7	7
15	30.01	29.84	20.010	68.		51.		59.5		51.2	12
16	30.18	30.01	30.171	64.5	3 P	45.	3 A	54.7	54.2	50.5	3
17	30.20	30.12	30.152	72.5	4 P	41.5	5 A	57.0	58.0	51.2	11
18	30.16	30.00	30.058	74.	3 P	40.5	5 A	57.2	61.	55.2	13
19	30.25	30.04	30.225	70.	3 P	49.	9 P	59.5	58.2	48.0	15
20	30.20	29.78	29.955	70.	2 P	48.5	4 A	59.2	59.3	53.7	5
21	29.79	29.64	29.689	69.	2 P	54.5	12 P	61.7	57.9	54.7	7
22	29.98	29.79	29.879	67.5	3 P	39.	5 A	53.2	51.5	47.7	15
23	30.00	29.88	29.933	70.	1 P	40.5	5 A	55.2	57.2	53.3	14
24	29.93	29.88	29.897	72.	3 P	54.	5 A	63.0	61.4	60.5	0
25	30.04	29.87	29.923	67.5	3 P	48.	12 P	55.7	58.2	55.7	2
26	30.11	30.04	30.079	59.5	3 P	41.	5 A	50.2	51.5	47.5	6
27	30.05	29.77	29.878	58.	12 M	45.	5 A	51.5	50.2	47.7	0
28	29.77	29.63	29.691	71.5	3 P	46.5	5 A	59.0	58.3	54.0	6
29	29.80	29.62	29 673	63.5	11 A	49.	12 P	56.2	55.7	51.0	6
30	29.88	29.80	29.860	71.5	3 P	45.5	0 A	53.5	59.1	56.0	11
31	29.71	29.86	29.783	71.	3 P	53.	12 P	62.0	58.8	55.8	7

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	SNOW.
1	46.3	.391	80.3	E.	194	1.	14	9 A	2-30 P	12 P	0.04	
2	44.0	.333	87.0	N.N.E.	231	4.5	30	11 A	0 A	12 P	0.20	
3	49.3	.401	89.7	W.	87	0.	—	—	0 A	12 P	0.28	
4	45.7	.354	75.7	S.S.W.	156	5.	32	9 A	0 A	9 A	0.14	
5	45.3	.526	62.3	N.N.W	131	2.	20	4 P				
6	47.0	.548	61.7	N.	262	6.	35	3 30 P				
7	32.3	.352	45.0	N.	232	6.5	36	6 P				
8	33.7	.374	57.3	N.N.W	179	5.	32	9 A				
9	44.0	.634	51.7	S.	160	5.	32	12-30 M				
10	51.3	.681	65.7	S.W.	186	22.	66	2 P	2-30 P	12 P	0.50	
11	50.7	.627	63.3	S.	132	2.	20	8 P				
12	57.3	.516	91.7	S.	196	3.5	26	3 P	5 A	4 P	0.37	
13	59.7	.525	99.0	S.	257	7.5	39	5 P	3 A	6 P	1.37	
14	58.0	.593	84.7	S.	103	2.5	22	3 P				
15	51.7	.487	82.0	N.W.	167	2.	20	3 P	0 A	3 A	0.05	
16	45.3	.455	70.3	E.N.E.	147	1.	14	8 A				
17	42.3	.537	53.3	N.N.W	86	0.5	10	12-30 M				
18	49.7	.590	63.7	W.N.W	97	3.	24	12 M				
19	38.7	.488	51.7	N.N.W	148	1.	14	8 A				
20	48.0	.548	66.3	S.	307	8.	40	3 P				
21	51.0	.516	74.3	W.	262	4.5	30	11-30 P	10 A	2 P	0.02	
22	39.7	.450	57.7	N W.	182	4.	28	11 A				
23	49.0	.506	71.7	S.	274	9.	42	10 A				
24	59.3	.580	87.0	S.	263	4.	28	6-30 A	0 A	12 M	0.35	
25	53.7	.503	85.0	W.	179	2.	20	12 M	0 A	1 P	0.75	
26	41.3	.414	64.0	N.	273	8.	40	8 A				
27	44.7	.368	82.0	N N.W	197	1.5	17	12-30 M	2 P	12 P	0.13	
28	47.3	.563	63.0	S.W.	81	3.5	26	1 A	0 A	10 A	0.07	
29	47.0	.447	74.7	N.W.	129	5.	32	1 A				
30	52.3	.554	73.3	S.S.W.	172	6.5	36	3 P				
31	52.7	.520	80.0	W.N.W	133	1.	14	6 P	1 A	11 A	0.11	

*At base of tower. T=trace. ** Included in following day.

REMARKS.

Contrary to current opinion, which has characterized the past month as rainy, cold and unseasonable, record shows the mean temperature of the month to have been less than one degree below normal and the amount of sunshine in excess of the mean for May. Yet the current opinion is not unfounded but is to be accounted for by the facts that the range of temperature has been unusually small, the highest and mean maximum daily temperatures exceedingly low, and the precipitation large. The wind movement too has been very large,—the highest on record for May at this station,—and several severe storms causing considerable damage to trees and plants were recorded, that of the 10th instant being the most severe.

The dull and rainy weather has been generally unfavorable to the rapid growth of garden truck and the crops. Corn is yellow and backward, as are onions. The asparagus crop has been light and poor. Potatoes are looking well however, and the pastures and grasslands are in prime condition, the grass being unusually heavy. Strawberries and lettuce are doing well and transplanted plants generally have rooted well, though they have not grown much.

The wind-storms damaged the newly-planted fields and the tender plants considerably in certain sections.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 102. JUNE, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.98, 7th, 10P.
Minimum reduced to freezing,	29.35, 30th, 2 P.
Reduced† maximum reading,	30.28, 7th, 10 P.
Reduced† min. reading,	29.63, 12th, 30th, 2 P.
Mean reduced†,	29.901
Monthly range,	0.65

****Air Temperature.*** In Degrees Fahr.

Highest,	85.5; 25th
Lowest,	38.0, 2d
Mean,	61.8
Mean of means of max. and min.,	62.0
Mean sensible (wet bulb),	57.6
Monthly Range,	47.5
Highest mean daily,	72.8, 25th
Lowest mean daily,	49.6, 1st
Mean maximum,	73.3
Mean minimum,	50.7
Mean daily range,	22.6
Greatest daily range,	33.0, 19th
Least daily range,	9.0, 7th, 9th, 10th

Humidity.

Mean dew point,	53.3
Mean force of vapor,	.600
Mean relative humidity,	73.3

Wind.

Prevailing Direction, West South West.

Summary.

South West,	10 per cent.
West,	17 " "
North,	13 " "
South,	23 " "
Other directions,	37 " "

Total movement,	4208 m.
Greatest daily movement,	272 m., 3d.
Least daily movement,	39m., 14th.
Mean daily movement,	140.3 m.
Mean hourly velocity,	5.8 m.
Maximum pressure per square foot,	7.0 lbs.= 37 m. per hour, 11.50 A. 1st, W.N.W.

Precipitation. In inches.

Total precipitation,	6.65
Number of days on which .01 inch or more rain or melted snow fell,	11

Weather.

Mean cloudiness observed,	47 per cent.
Total cloudiness recorded by the Sun Thermometer,	209.0 hours or 46 per cent.
Number of clear days,	8
Number of fair days,	11
Number of cloudy days,	11

Bright Sunshine.

Number of Hours recorded, 248 hours or 54%

Rain, 3d, 4th, 5th, 8th, 9th, 10th, 12th, 13th, 14th, 15th, 20th, 29th, 30th.

Gales, of 35 or more miles per hour, 37m., 1st, W.N.W.; 36m., 3d, S.S.W.; 35m., 21st, W.N.W.; 36m., 22d, S.W.

Thunder and Lightning, 3d, 4th, 9th, 13th.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.01	29.83	29.896	56.5	3 P	42.	5 A	49.2	49.6	45.8	2
2	30.13	30.01	30.094	68.5	4 P	38.	4 A	53.2	55.5	50.5	15
3	30.11	29.82	29.902	73.	4 P	48.	5 A	60.5	60.9	59.8	0
4	29.83	29.78	29.801	81.	1 P	62.	5 A	71.5	70.0	67.5	5
5	29.97	29.80	29.863	71.5	3 P	60.	12 P	65.7	64.9	61.3	3
6	30.20	29.97	30.080	72.	1 P	52.	5 A	62.0	60.6	57.3	3
7	30.28	30.20	30.256	61.5	2 P	52.5	12 P	57.0	55.6	52.5	0
8	30.27	30.20	30.229	63.	3 P	48.	5 A	55.5	53.8	51.2	0
9	30.21	29.86	30.046	57.	3 P	48.	5 A	52.5	50.7	51.0	0
10	29.95	29.83	29.876	61.	3 P	52.	5 A	56.5	56.0	55.5	0
11	29.95	29.81	29.860	79.	4 P	53.	5 A	66.0	65.2	59.0	14
12	29.81	29.63	29.694	78.5	3 P	58.5	5 A	68.5	66.8	62.3	9
13	29.68	29.56	29.629	76.	3 P	52.	5 A	64.0	61.5	58.7	11
14	29.80	29.67	29.751	73.5	3 P	52.5	5 A	63.0	61.2	57.0	8
15	29.82	29.75	29.779	77.	12 M	49.	5 A	63.0	62.8	59.5	8
16	29.92	29.74	29.791	76.	5 P	47.	4 A	61.5	64.1	56.3	15
17	29.93	29.79	29.850	73.5	3 P	43.	5 A	58.2	61.7	58.0	10
18	29.98	29.77	29.826	79.5	3 P	54.5	12 P	67.0	66.8	57.8	12
19	30.04	29.83	29.951	80.	3 P	47.	4 A	63.5	65.8	61.0	14
20	29.83	29.64	29.717	74.	1 P	56.5	12 P	65.2	60.0	56.2	5
21	29.89	29.78	29.828	67.	3 P	39.5	5 A	53.2	56.0	51.2	12
22	29.96	29.89	29.938	74.	3 P	43.5	4 A	58.7	61.0	55.2	14
23	29.99	29.89	29.945	79.	1 P	49.5	5 A	64.2	66.0	62.0	15
24	29.97	29.84	29.903	82.	12 M	59.5	4 A	70.7	71.7	68.3	14
25	29.84	29.67	29.731	85.5	3 A	67.5	12 P	76.5	72.8	64.0	9
26	30.04	29.79	29.913	72.	1 P	54.	12 P	63.0	62.1	54.5	10
27	30.11	30.04	30.084	70.	3 P	38.5	4 A	54.2	57.3	51.7	11
28	30.12	30.03	30.065	77.	4 P	44.5	3 A	60.7	63.9	56.7	15
29	30.10	29.94	30.038	77.	1 P	48.	5 A	62.5	62.1	60.3	6
30	29.94	29.63	29.708	83.5	3 P	59.5	1 A	71.5	68.4	64.7	8

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	41.3	.365	72.3	W.	168	7.	37	11-30 A				
2	43.7	.488	61.7	S.W.	127	2.5	22	6 A				
3	58.3	.570	86.7	S.S.E.	272	6.5	36	5 A	9 A	12 P	0.03	
4	66.0	.725	90.7	S.	136	1.	14	1 A	0 A	3 P	0.12	
5	59.0	.624	82.3	N.N.E.	95	0.	—	———	2 A	8 A	0.05	
6	54.3	.545	80.0	S.E.	101	0.5	10	4 P				
7	49.0	.459	78.7	E.S.E.	109	0.5	10	4 P				
8	48.0	.430	80.7	E.S.E.	136	0.5	10	3 P	5 P	12 P	0.02	
9	50.3	.378	98.0	N.	182	5.	32	4 P	0 A	12 P	4.10	
10	54.3	.468	90.3	N.	267	4.5	30	3 P	0 A	2 P	0.08	
11	53.3	.657	68.0	N.W.	96	1.	14	1 P				
12	59.0	.685	75.7	W.	73	0.	—	———	0 A	8 A	T.	
13	54.3	.626	73.7	N.W.	75	3.	24	3 P	3 P	7 P	0.43	
14	52.7	.555	72.3	N.N.W	39	1.	14	1 P	1 P	4 P	0.10	
15	56.7	.595	78.7	S.	65	3.5	26	1 P	12-30 M	6 P	.T	
16	49.3	.634	60.0	S.W.	143	3.	24	10 A				
17	55.0	.583	77.7	S.	64	0.	—	———				
18	50.7	.683	59.7	N.	110	1.	14	1-30 P				
19	53.7	.715	65.3	S.	102	2.5	22	11 P				
20	52.0	.573	71.0	W.	253	3.	24	1 P	3 A	11 A	0.32	
21	43.7	.507	58.3	W.N.W	178	6.	35	3 P				
22	47.7	.606	58.0	S.S.W.	136	6.5	36	9 A				
23	57.7	.716	69.7	S.	228	4.5	30	3 P				
24	66.0	.826	79.3	S.	243	3.5	26	3 P				
25	57.3	.860	61.3	W.	178	1.	14	3 P			T.	
26	53.7	.585	72.7	N.	151	3.	24	2 P				
27	43.3	.539	55.0	S.W.	113							
28	49.7	.645	58.3	W.S.W	164							
29	58.0	.604	85.0	S.	44	0.	—	———	5 P	12 P	0.94	
30	61.3	.763	77.3	W.	160	2.	20	2 A	0 A	6 A	0.46	

*At base of tower. T=trace. ** Included in followingday.

REMARKS.

The weather of the past month has been characterized by a large wind movement, by an excessive rainfall, and by a mean temperature more than five degrees below the normal. During the storm of the 9th instant 4.1 inches of rain fell in a period of twenty one hours, the largest amount ever recorded at this station in an equal length of time. Some damage was done to grass and grain crops by lodging and considerable to cultivated crops, especially on hillsides, by washing.

In general the weather has been favorable for a slow development of crops. Corn and other crops which require warm weather for their best growth are backward as a rule, while the hay crop is excellent. The month has been especially favorable for strawberries, the heavy rain of the early part of the month being followed by dry weather during picking season, and the water which fell on the 29th and 30th will undoubtedly aid in keeping the berries in the market later than usual.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 103. JULY, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.04, 19th, 7 A.
Minimum reduced to freezing, 29.33, 12th, 4 P.
Reduced† maximum reading, 30.33, 19th, 7 A.
Reduced† min. reading, . . . 29.61, 12th, 4 P.
Mean reduced†, ... 29.943
Monthly range, ... 0.72

Air Temperature. In Degrees Fahr.*

Highest, ... 91.; 6th, 9th
Lowest, ... 55., 1st, 27th
Mean, ... 70.5
Mean of means of max. and min., ... 71.6
Mean sensible (wet bulb), ... 67.1
Monthly Range, ... 36.
Highest mean daily, ... 78.1, 9th
Lowest mean daily, ... 60.5, 29th
Mean maximum, ... 81.0
Mean minimum, ... 62.3
Mean daily range, ... 18.7
Greatest daily range, ... 29., 16th
Least daily range, ... 4., 13th

Humidity.

Mean dew point, ... 64.6
Mean force of vapor, ...787
Mean relative humidity, ... 80.8

Wind.

Prevailing Direction, South.

Summary.

South, ... 42 per cent.
South, South West, ... 13 " "
North, ... 10 " "
Other directions, ... 35 " "

Total movement, ... 4007 m.
Greatest daily movement, . . . 317 m., 14th
Least daily movement, ... 36 m., 16th
Mean daily movement, ... 129.3 m.
Mean hourly velocity, ... 5.4 m.
Maximum pressure per square foot, 12 lbs.= 49 m. per hour, 7 P., 14th, W.

Precipitation. In inches.

Total precipitation, ... 14.51
Number of days on which .01 inch or more rain or melted snow fell, ... 14

Weather.

Mean cloudiness observed, . . . 64 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 249.0 hours or 54 per cent.
Number of clear days, ... 5
Number of fair days, ... 13
Number of cloudy days, ... 13

Bright Sunshine.

Number of Hours recorded, 214 hours or 46%

Rain, 2d, 3d, 6th, 7th, 12th, 13th, 14th, 17th, 18th, 19th, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th.

Gales, of 35 or more miles per hour, 36m., 13th, S.S.E.; 49 m., 14th, W.; 47 m., 23d, S.W.

Thunder and Lightning, 6th, 7th, 11th, 23d

Hail, ... 14th, 23d

* Temperature in ground shelter.

† Reduced to freezing and sea level.

** Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.&MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	29.80	29.72	29.792	83.	3 P	55.	5 A	69.	70.8	64.5	13
2	29.86	29.73	29.777	81.	1 P	56.5	5 A	68.7	68.9	66.7	8
3	30.13	29.86	30.013	83.	3 P	62.	3 A	72.5	70.7	69.	7
4	30.20	30.08	30.121	82.	3 P	65.	4 A	73.5	72.1	65.7	11
5	30.08	29.94	29.994	89.5	4 P	65.5	4 A	77.5	76.5	72.3	13
6	30.05	29.91	29.975	91.	1 P	65.5	4 A	78.2	74.	70.8	9
7	30.13	30.04	30.100	87.5	1 P	65.	4 A	76.2	73.7	71.5	4
8	30.13	29.97	30.050	85.	3 P	66.	4 A	75.5	74.2	69.3	13
9	29.97	29.82	29.878	91.	2 P	64.5	3 A	77.7	78.1	73.7	14
10	29.97	29.88	29.939	87.	9 A	65.5	4 A	76.2	73.3	68.5	11
11	29.95	29.68	29.760	84.	3 P	62.5	5 A	73.2	73.7	70.5	5
12	29.67	29.61	29.651	81.	2 P	69.5	4 A	75.2	74.7	72.8	0
13	29.95	29.63	29.709	72.5	1 A	68.5	6 A	70.5	69.8	69.5	0
14	29.93	29.63	29.762	82.	2 P	63.5	12 P	72.7	70.7	68.	4
15	30.10	29.93	30.025	81.	3 P	59.	4 A	70.	69.4	64.2	10
16	30.13	30.07	30.107	85.5	3 P	56.5	5 A	71.	72.3	66.7	13
17	30.21	30.12	30.162	84.	1 P	62.	4 A	73.	70.7	67.	8
18	30.33	30.21	30.284	81.	2 P	60.	4 A	70.5	70.2	67.2	5
19	30.33	30.24	30.276	83.	12 M	65.5	4 A	74.2	72.8	69.2	9
20	30.24	30.06	30.127	84.	3 P	69.	2 A	76.5	73.9	70.5	8
21	30.06	29.98	30.024	80.	1 P	67.5	6 A	73.7	71.9	69.2	3
22	29.98	29.79	29.872	77.	4 P	69.5	0 A	73.2	71.8	71.2	0
23	29.84	29.63	29.713	85.	3 P	63.	12 P	74.	70.8	69.5	8
24	29.67	29.57	29.617	80.5	1 P	61.	1 A	70.7	67.5	65.2	5
25	29.97	29.66	29.816	80.	3 P	60.5	4 A	70.2	69.7	67.5	9
26	30.08	29.97	30.043	69.	3 P	58.	12 P	63.5	62.3	56.0	2
27	30.08	30.03	30.059	69.5	1 P	55.	5 A	62.2	61.1	56.3	2
28	30.05	29.94	29.966	66.	11 A	57.5	5 A	61.7	60.7	58.8	1
29	29.94	29.79	29 864	65.	1 P	55.5	5 A	60.2	60.5	60.0	0
30	29.94	29.88	29.908	79.	6 P	58.5	5 A	68.7	68.2	63.5	9
31	29.92	29.80	29.859	81.5	3 P	60.	5 A	70.7	71.0	64.5	10

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	SNOW.
1	59.	.828	64.7	S.S.W.	84	1.	14	3 P				
2	64.7	.746	82.	S.	103	0.5	10	4 P	5 P	7 P	0.03	
3	67.3	.821	83.3	S.S.E.	79	0.	—	———	5 P		T.	
4	54.7	.816	57.7	S.	188	1.5	17	4 P				
5	70.	.972	80.3	S.	144	0.	—	———				
6	69.	.895	80.7	W.S.W	99	2.5	22	1-30 P	2-15 P	5-30 P	0.11	
7	70.7	.823	91.7	S.	53	0.	—	———	1 P	2 P	0.02	
8	67.3	.871	79.7	S.	151	2.	20	4 P				
9	70.	1.022	75.7	S.S.W.	130	1.	14	2 P				
10	65.3	.841	75.7	E.S.E.	161	2.5	22	11 A				
11	68.3	.886	79.7	W.S.W	122	3.5	26	7 P				
12	70.	.914	84.3	S.	233	5.5	33	3 P	8-30 P	12 P	0.25	
13	69.3	.724	99.3	S.	131	6.5	36	9 P	0 A	12 P	5.49	
14	66.	.791	86.	S.	317	12.	49	7 P	0 A	8 P	2.51	
15	61.	.748	77.7	S.S.W.	87	0.5	10	3 P				
16	62.	.847	72.7	S.S.W.	36	0.5	10	3 P				
17	64.7	.800	78.7	S.	63	3.	24	2 P	3 P	3-30 P	0.03	
18	65.3	.790	80.7	S.S.W.	39	0.	—	———	9 P		0.01	
19	67.	.843	79.7	E.S.E.	78	1.5	17	3 P	8-30 P		T.	
20	69.	.854	85.3	S.	119	2.	20	5 P				
21	67.7	.800	84.7	S.	178	4.	28	4 P				
22	70.7	.793	94.7	S.	234	5.5	33	9 A	2 A	6-30 P	1.82	
23	71.7	.847	84.	S.	181	11.	47	6 P	8-30 P	6-30 P	0.53	
24	63.3	.681	88.3	W.	53	2.5	22	3 P	11-30 A	10 P	0.46	
25	64.3	.813	76.3	N.N.W	86	1.	14	2 P	4 P	12 P	T.	
26	51.7	.556	70.3	N.E.	158	2.	20	11 A	0 A	7-30 A	0.22	
27	54.0	.550	77.0	N.E.	165	1.5	17	1 P	4 P		T.	
28	56.7	.536	87.3	E.N.E.	136	1.	14	12 M	1 P	12 P	0.86	
29	59.3	.533	95.3	N.	175	2.5	22	7-30 A	0 A	6-30 A	2.17	
30	61.0	.680	82.0	W.	68	1.	14	—				
31	60.3	.785	70.3	W.	156	5.5	33	11-30 A				

*At base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for July has been characterized by the largest rainfall ever recorded at this station for a single month, the precipitation of 14.51 inches being about one-third of the average annual rainfall. On the 13th also the greatest daily rainfall ever observed here was recorded.

Harvesting has progressed with difficulty and much of the hay crop has been injured.

The excess of moisture has injured the tobacco crop and is also causing potatoes to rot upon low ground.

Corn is very backward and is tasselling low.

The continued damp weather has been very favorable for blights especially on plums and grapes.

J. E. OSTRANDER, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 104. AUGUST, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.89, 21st, 7 A.
Minimum reduced to freezing, 29.28, 11th, 5 P.
Reduced† maximum reading, 30.18, 21st, 7 A.
Reduced† min. reading, . . . 29.57, 11th, 5 P.
Mean reduced†, ... 29.943
Monthly range, ... 0.61

****Air Temperature.*** In Degrees Fahr.

Highest, ... 85.; 3d, 4th
Lowest, ... 42., 21st
Mean, ... 66.
Mean of means of max. and min., ... 66.8
Mean sensible (wet bulb), ... 62.7
Monthly Range, ... 43.
Highest mean daily, ... 72.7, 4th
Lowest mean daily, ... 56.5, 24th
Mean maximum, ... 77.5
Mean minimum, ... 56.1
Mean daily range, ... 21.4
Greatest daily range, ... 33.5, 21st
Least daily range, ... 6.5, 24th

Humidity.

Mean dew point, ... 59.7
Mean force of vapor, ...676
Mean relative humidity, ... 79.6

Wind.

Prevailing Direction, South South West.

Summary.

South, ... 29 per cent.
South South West, ... 13 " "
West South West, ... 10 " "
South West, ... 10 " "
South South East, ... 10 " "
Other directions, ... 28 " "

Total movement, ... 3452 m.
Greatest daily movement, . . . 184 m., 16th
Least daily movement, ... 43 m., 7th
Mean daily movement, ... 111.4 m.
Mean hourly velocity, ... 4.6 m.
Maximum pressure per square foot, 14 lbs.= 53 m. per hour, 4 P., 15th, S.S.W.

Precipitation. In inches.

Total precipitation, ... 4.29
Number of days on which .01 inch or more rain or melted snow fell, ... 8

Weather.

Mean cloudiness observed, . . . 42 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 155.0 hours or 36 per cent.
Number of clear days, ... 8
Number of fair days, ... 15
Number of cloudy days, ... 8

Bright Sunshine.

Number of Hours recorded, 274 hours or 64%

Rain, 4th, 5th, 9th, 10th, 11th, 12th, 15th, 16th, 18th, 22d, 24th.

Gales, of 35 or more miles per hour, 38m., 12th, W.N.W.; 53 m., 15th, S.S.W.; 36 m., 22d, S.S.W.

Thunder and Lightning, 15th, 22d.

Hail, ... 22d.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

** Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	29.93	29.83	29.881	81.5	3 P	60.	4 A	70.7	69.3	65.2	10
2	30.05	29.93	29.990	83.	5 P	58.5	0 A	70.7	70.	65.7	10
3	30.11	30.00	30.057	85.	3 P	63.	0 A	74.	72.	68.7	11
4	30.09	29.97	30.044	85.	2 P	64.	4 A	74.5	72.7	70.2	10
5	30.12	30.04	30.099	76.5	5 P	58.5	12 P	67.5	64.5	61.3	9
6	30.13	30.04	30.096	83.	4 P	52.5	5 A	67.7	66.	61.2	14
7	30.17	30.09	30.128	84.	4 P	51.5	5 A	67.7	67.8	61.8	13
8	30.12	30.00	30.046	82.5	1 P	55.	5 A	68.7	69.2	65.3	9
9	29.99	29.89	29.917	80.	2 P	61.	12 P	70.5	67.	63.3	6
10	29.90	29.78	29.826	78.	2 P	55.	5 A	66.5	64.4	64.	5
11	29.76	29.57	29.619	77.	1 P	63.5	12 P	70.2	66.5	65.2	4
12	29.91	29.62	29.751	77.5	1 P	57.5	12 P	67.5	65.8	61.7	10
13	30.02	29.91	29.997	74.	4 P	54.	4 A	64.	64.6	60.2	14
14	30.04	29.96	29.991	83.5	3 P	54.	5 A	68.7	70.9	66.8	14
15	29.96	29.84	29.891	79.5	3 P	65.5	12 P	72.5	70.1	69.7	0
16	29.85	29.63	29.710	81.	4 P	65.	12 P	73.	72.1	68.8	6
17	29.97	29.68	29.820	69.5	11 A	58.	12 P	63.7	64.	57.8	8
18	30.02	29.97	30.002	73.	1 P	49.	6 A	61.	61.2	59.3	10
19	30.01	29.89	29.934	76.	12 M	54.	0 A	65.	64.3	62.3	9
20	30.12	29.89	30.001	71.5	12 M	55.5	12 P	63.5	62.8	56.0	12
21	30.18	30.04	30.093	75.5	2 P	42.	6 A	58.7	61.9	58.5	10
22	30.04	29.84	29.904	79.	1 P	62.	4 A	70.5	67.7	67.0	4
23	30.02	29.92	30.010	68.5	1 P	55.	5 A	61.7	61.5	58.2	5
24	29.98	29.80	29.840	61.5	3 P	55.	12 P	58.3	56.5	57.0	0
25	29.91	29.82	29.850	73.	5 P	52.5	0 A	62.7	62.9	63.5	5
26	30.03	29.91	29.973	76.5	3 P	54.	12 P	65.2	64.	59.2	12
27	30.03	29.85	29.926	75.5	4 P	47.	5 A	61.2	63.	60.2	10
28	30.00	29.84	29.897	79.	3 P	60.	12 P	69.5	67.9	63.8	10
29	30.06	29.93	29 997	80.5	3 P	51.	5 A	65.7	66.2	63.2	13
30	29.97	29.88	29.913	78.	3 P	58.	12 P	68.	66.5	62.8	9
31	30.08	29.97	30.028	75.5	4 P	48.5	5 A	62.	61.5	56.7	12

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES'	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	SNOW.
1	62.3	.746	76.7	N.N.W	102	2.5	22	12 M				
2	62.7	.761	77.0	E.N.E.	80	1.	14	8 A				
3	66.7	.829	83.0	S.	102	2.	20	7 P				
4	68.0	.890	80.7	S.S.W.	136	2.	20	10 P	12-30 P	1 P	T.	
5	58.	.621	85.0	N.	171	1.5	17	2 P	1 A	10 A	0.73	
6	56.7	.709	72.0	N.N.W	68	5.	32	4 P				
7	54.3	.688	67.3	S.	43	—	—	———				
8	56.0	.766	62.3	S.S E.	96	0.5	10	2 P				
9	60.3	.708	78.0	S.W.	74	1.5	17	3 P	3 P	4-30 P	T.	
10	62.3	.688	85.7	S.S.W.	54	4.	28	3 P	5 P	9 P	0.25	
11	64.	.680	89.0	S.S.E.	152	3.	24	1 P	7 A	8 P	0.59	
12	58.	.682	73.7	W.S.W	115	7.	38	3 P	3 P		T.	
13	55.3	.656	70.7	S.W.	109	1.5	17	3 P				
14	64.3	.814	77.0	S.	103	1.	14	3 P				
15	68.3	.779	91.7	S.	157	14.	53	4 P	3 A	12 P	1.31	
16	66.7	.809	83.3	S.S.W.	184	2.5	22	1-30 P	0 A	8-30 P	0.03	
17	53.7	.586	71.7	W.S.W	179	3.	25	10 A				
18	57.7	.561	87.0	S.	80	1.	14	5 P	6 P	7 P	0.02	
19	60.	.656	82.7	S.	91	1.5	17	3 P				
20	49.3	.607	61.0	W.N.W	113	4.5	30	12 M				
21	55.	.624	73.7	S.	91	1.5	17	1-30 P				
22	65.3	.737	87.3	S.	160	6.5	36	2 P	2-30 P	3-30 P	0.68	
23	55.3	.557	79.7	N.E.	158	2.	20	0-30 A				
24	56.3	.477	96.0	N.	122	0.5	10	2 P	7 A	6 P	0.68	
25	62.7	.629	91.7	S.S.E.	140	4.5	30	1 P				
26	56.7	.607	80.7	N.W.	65	0.5	10	11 A				
27	58.0	.611	86.0	S.	95	3.	24	2 P				
28	61.	.709	80.	S.W.	116	1.	14	2 P				
29	60.3	.709	77.7	S.S.W.	67	0.5	10	4 P				
30	60.7	.678	82.	W.S.W	177	2.	20	11-30 A				
31	53.7	.573	77.	W.	52	1.	14	11-30 A				

*At base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for the month has been marked by no unusual characteristics. The rainfall while slightly above the average for August showed a marked decrease compared with the excessive precipitation of June and July. The temperature has been somewhat below the average and most of the month cool and pleasant. No unusually warm days have been observed.

The percentage of sunshine has been above the average; the wind movement about normal.

Fall crops have shown an improvement during the month. Corn is doing very well. The tobacco crop while poor showed an improvement over the condition of the previous month.

The fruit crop in general is in good condition.

J. E. OSTRANDER, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 105. SEPTEMBER, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.10, 4th, 7 A.
Minimum reduced to freezing, 29.38, 26th, 6 P.
Reduced† maximum reading, 30.40, 4th, 7 A.
Reduced† min. reading, . . . 29.67., 26th, 6 P.
Mean reduced†, ... 30.091
Monthly range, ... 0.72

****Air Temperature.*** In Degrees Fahr.

Highest, ... 91.5; 10th
Lowest, ... 32.0, 28th
Mean, ... 59.8
Mean of means of max. and min., . . . 60.11
Mean sensible (wet bulb), ... 56.2
Monthly Range, ... 59.5
Highest mean daily, ... 76.5, 10th
Lowest mean daily, ... 46.4, 28th
Mean maximum, ... 73.0
Mean minimum, ... 47.2
Mean daily range, ... 25.8
Greatest daily range, ... 39.0, 30th
Least daily range, ... 11.5, 8th, 20th

Humidity.

Mean dew point, ... 52.7
Mean force of vapor, ...582
Mean relative humidity, ... 76.6

Wind.

Prevailing Direction, West South West.

Summary.

North,	20	per cent.
South,	13	" "
South East,	10	" "
South South West,	10	" "
West,	10	" "
North West,	10	" "
Other directions,	27	" "

Total movement, ... 3506 m.
Greatest daily movement, . . . 241 m., 19th
Least daily movement, ... 27 m., 29th
Mean daily movement, ... 116.9 m.
Mean hourly velocity, ... 4.9 m.
Maximum pressure per square foot, 20 lbs.= 64 m. per hour, 6 P., 26th, N.

Precipitation. In inches.

Total precipitation, ... 1.94
Number of days on which .01 inch or more rain or melted snow fell, ... 8

Weather.

Mean cloudiness observed, . . . 39 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 152.0 hours or 41 per cent.
Number of clear days, ... 12
Number of fair days, ... 9
Number of cloudy days, ... 9

Bright Sunshine.

Number of Hours recorded, 221 hours or 59%

Rain, 1st, 2d, 7th, 8th, 11th, 13th, 17th, 20th, 23d, 24th, 26th.

Gales, of 35 or more miles per hour, 39m., 11th, N.N.E.; 36 m., 17th, N.; 35 m., 21st, N.W.; 64 m., 26th, N.W.; 37 m., 27th, N.

Thunder and Lightning, 13th, 26th.

Frost, ... 22d, 28th.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.								NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.& MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE.	WET BULB.	
1	30.12	30.02	30.070	78.	1 P	48.	5 A	63.	63.5	60.5		9
2	30.16	30.01	30.044	76.	5 P	55.	12 P	65.5	64.	61.8		4
3	30.34	30.16	30.267	70.	3 P	48.5	6 A	59.3	59.2	55.5		13
4	30.40	30.30	30.338	73.	4 P	42.5	5 A	57.7	57.3	53.2		12
5	30.31	30.15	30.199	83.5	3 P	50.	4 A	66.7	64.8	62.8		9
6	30.21	30.09	30.153	89.5	3 P	51.5	6 A	70.5	69.5	65.7		10
7	30.32	30.21	30.297	75.	2 P	59.5	5 A	67.3	66.9	62.3		6
8	30.29	30.18	30.181	70.	3 P	58.5	3 A	64.3	64.	63.2		0
9	30.10	30.01	30.057	89.	3 P	62.5	5 A	75.7	72.4	69.8		10
10	30.08	30.03	30.041	91.5	3 P	61.5	4 A	76.5	76.5	71.5		10
11	30.23	30.01	30.070	86.	1 P	52.	12 P	69.	69.7	64.		7
12	30.29	30.14	30.220	70.5	3 P	45.5	6 A	58.	58.2	55.		8
13	30.14	29.88	29.934	78.	5 P	58.5	5 A	68.3	65.5	63.7		2
14	30.24	29.91	30.122	69.	3 P	50.	12 P	59.5	59.7	53.		9
15	30.29	30.12	30.192	74.	4 P	43.	6 A	58.5	57.2	54.8		12
16	30.12	29.77	29.952	75.5	3 P	45.	3 A	60.3	60.8	59.7		3
17	29.93	29.72	29.788	79.	2 P	49.	12 P	64.	64.8	58.5		5
18	29.98	29.88	29.931	67.5	3 P	37.5	6 A	52.5	52.5	47.8		10
19	29.93	29.86	29.911	73.	3 P	46.	2 A	59.5	59.8	57.		7
20	29.97	29.90	29.917	61.5	8 A	50.	12 P	55.7	55.5	52.8		0
21	30.26	29.97	30.144	60.5	3 P	38.	12 P	49.3	49.4	44.3		10
22	30.31	30.23	30.275	60.	1 P	33.	6 A	46.5	47.3	44.2		3
23	30.27	30.10	30.181	62.	3 P	46.	6 A	54.	53.2	50.7		0
24	30.10	29.87	29.909	62.	3 P	50.	3 A	56.	55.5	55.3		1
25	30.09	29.98	30.037	76.	3 P	48.5	6 A	62.2	61.	56.		12
26	30.04	29.67	29.831	78.	1 P	44.	6 A	61.	60.7	55.5		7
27	30.17	29.83	30.047	58.	3 P	40.	12 P	49.	52.	44.8		11
28	30.24	30.13	30.174	60.5	3 P	32.	5 A	46.3	46.4	41.2		11
29	30.29	30.21	30.259	69.	4 P	34.5	4 A	51.7	51.	47.3		9
30	30.30	30.14	30.200	75.	3 P	36.	6 A	55.5	55.2	52.5		11

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	SNOW.
1	57.7	.640	79.3	S.	50	1.	14	3 P	10 P	12 P	T.	
2	60.3	.624	86.	N.	94	1.5	17	10 P	0 A	2 P	1.03	
3	52.3	.527	76.	N.	175	4.	28	8 A				
4	50.	.493	77.	S.E.	200	1.	14	10 P				
5	60.7	.708	82.7	S.	77	1.5	17	4 P				
6	63.3	.800	82.3	W.S.W	35	0.5	10	4 P				
7	59.3	.675	77.7	S.E.	91	0.5	10	9 P	9-15 P	12 P	T.	
8	62.3	.621	90.7	S.	167	2.	20	4 P	0 A	6 A	0.03	
9	68.	.884	83.3	S.W.	38	0.5	10	4 P				
10	68.7	1.008	74.	S.	78	0.5	10	4 P				
11	61.	.741	76.7	N.N.W	123	7.5	39	1 P	4 P		T.	
12	49.	.557	66.	S.S.W.	106	1.	14	10 P				
13	59.7	.749	73.7	S.E.	192	2.	20	4 A	2-30 P	4 P	0.02	
14	54.	.519	83.7	N.	172	4.5	30	4 P				
15	51.3	.515	80.3	N.N.W	57	1.	14	12 M				
16	57.7	.614	83.3	S.S.E.	52	2.	20	3 P				
17	53.3	.662	65.3	N.	173	6.5	36	3 P	5 A	12 M	0.11	
18	41.3	.454	65.	N.W.	97	0.5	10	11 P				
19	53.7	.565	75.	S.S.W.	241	4.5	30	12 M				
20	51.	.435	88.	N.	132	2.	20	1 P	9 A	3 P	0.11	
21	38.	.365	68.7	N.W.	198	6.	35	8 A				
22	42.3	.363	79.7	N.E.	79	0.5	10	4 P				
23	46.3	.433	79.3	N.N.E.	172	2.5	22	2 P	3 P	12 P	0.11	
24	54.3	.460	92.3	W.	99	0.5	10	2 A	0 A	3 P	0.12	
25	52.	.582	72.	W.	51	0.	—	—				
26	52.	.566	77.7	N.W.	109	20.	64	6 P	6 P	7 P	0.41	
27	36.3	.383	57.3	N.	218	7.	37	12 M				
28	34.3	.344	62.	N.N.E.	132	5.	32	1 P				
29	41.7	.430	69.3	S.S.W.	27	0.	—	—				
30	48.	.535	72.7	W.	51	0.5	10	2 P				

*At base of tower. T=trace. ** Included in following day.

REMARKS.

The most notable features of the weather for September have been the large range of temperature, the small precipitation and the large percentage of sunshine. The rainfall, 1.94 in., is about one half the average for this month and the smallest on record for September at this station. The temperature on the 10th is the maximum recorded here so far this year. The wind movement has been slightly below the average, and the humidity about normal.

About 6 P. M. on the 26th a quite severe wind storm accompanied by considerable rain occurred, a velocity of 64 miles per hour being attained and the temperature falling nearly 10 degrees in less than an hour. Reports indicate however that but little damage was done.

The weather has been favorable for maturing crops, and the harvesting of the second cutting of hay has progressed satisfactorily.

Fruit has fallen badly during the month.

The frosts so far observed have done but little damage in this locality.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 106. OCTOBER, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.36, 3d, 7 A
Minimum reduced to freezing, 29.25, 29th, 5 A.
Reduced† maximum reading, 30.67, 3d, 7 A.
Reduced† min. reading, . . . 29.55., 29th, 5 A.
Mean reduced†, ... 30.122
Monthly range, ... 1.11

****Air Temperature.*** In Degrees Fahr.

Highest, ... 84.0; 1st, 10th
Lowest, ... 20.5, 31st
Mean, ... 49.9
Mean of means of max. and min., ... 49.8
Mean sensible (wet bulb), ... 45.0
Monthly Range, ... 63.5
Highest mean daily, ... 71.5, 16th
Lowest mean daily, ... 36.4, 30th
Mean maximum, ... 63.9
Mean minimum, ... 35.8
Mean daily range, ... 28.1
Greatest daily range, ... 47., 4th
Least daily range, ... 8., 21st

Humidity.

Mean dew point, ... 39.0
Mean force of vapor, ...405
Mean relative humidity, ... 68.7

Wind.

Prevailing Direction, West South West.

Summary.

South, ... 19 per cent.
South South West, ... 13 " "
North West, ... 10 " "
North North West, ... 10 " "
North, ... 10 " "
Other directions, ... 38 " "

Total movement, ... 3938 m
Greatest daily movement, . . . 339 m., 12th
Least daily movement, ... 24 m., 3d
Mean daily movement, ... 127 m.
Mean hourly velocity, ... 5.3 m.
Maximum pressure per square foot, 11.5 lbs.= 48 m. per hour, 4 A., 17th, N.N.W.

Precipitation. In inches.

Total precipitation, ... 0.73
Number of days on which .01 inch or more rain or melted snow fell, ... 1

Weather.

Mean cloudiness observed, . . 39.1 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 132.0 hours or 39 per cent.
Number of clear days, ... 14
Number of fair days, ... 8
Number of cloudy days, ... 9

Bright Sunshine.

Number of Hours recorded, 209 hours or 61%

Rain, 1st, 12th.

Gales, of 35 or more miles per hour, 45m., 9th, S.; 47 m., 12th, S.S.W.; 41 m., 16th, W.N.W.; 48 m., 17th, N.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DEPRESS.	MEAN SENSIBLE. WET BULB.	
1	30.28	29.98	30.091	84.	2 P	47.	6 A	65.5	64.7	54.5	10
2	30.62	30.28	30.525	61.	3 P	37.	12 P	49.	51.5	42.7	11
3	30.67	30.52	30.595	66.5	4 P	28.	6 A	47.2	45.	40.8	11
4	30.52	30.28	30.376	75.	4 P	28.	5 A	51.5	48.5	44.5	9
5	30.28	29.94	30.079	74.	3 P	29.5	6 A	51.8	51.3	46.5	10
6	29.94	29.74	29.809	67.	3 P	44.	4 A	55.5	54.7	52.	5
7	30.01	29.83	29.878	62.	1 P	36.	6 A	49.	50.2	47.7	3
8	30.11	29.95	30.032	63.	3 P	36.	6 A	49.5	49.	43.2	9
9	30.26	29.87	30.023	62.	1 P	37.	12 P	49.5	52.	44.2	11
10	30.34	30.22	30.262	57.	4 P	24.	6 A	40.5	40.8	36.	10
11	30.25	30.02	30.119	65.	12 P	35.5	4 A	50.2	48.	47.3	0
12	30.06	29.85	29.922	70.	10 A	61.	12 P	65.5	64.9	62.7	0
13	30.47	30.06	30.315	68.	3 P	43.	12 P	55.5	56.2	48.5	11
14	30.56	30.31	30.435	68.5	3 P	34.	6 A	51.2	51.9	48.	10
15	30.31	30.06	30.134	83.	3 P	48.	5 A	63.5	65.2	61.7	9
16	30.06	29.70	29.853	84.	1 P	55.	5 A	79.5	71.5	64.3	8
17	30.39	29.77	30.200	62.	0 A	33.	12 P	47.5	47.7	37.5	10
18	30.46	30.22	30.338	58.	3 P	25.	5 A	41.5	42.1	38.3	11
19	30.22	30.02	30.085	63.	3 P	33.	6 A	48.	47.	41.8	6
20	30.11	30.00	30.062	59.	1 P	36.5	5 A	47.7	48.1	46.	5
21	30.06	29.94	29.999	51.	3 P	43.	12 P	47.	46.3	40.7	0
22	30.31	30.06	30.207	50.	4 P	33.	12 P	41.5	41.9	37.8	1
23	30.36	30.31	30.350	60.5	3 P	25.5	6 A	43.	41.	37.	10
24	30.34	30.04	30.203	51.	3 P	26.5	5 A	38.7	39.8	38.7	0
25	30.04	29.93	29.974	65.	3 P	43.5	2 A	54.2	52.9	47.2	2
26	30.16	30.03	30.096	64.5	3 P	39.	5 A	51.7	51.5	44.9	10
27	30.23	30.08	30.166	68.	2 P	30.	6 A	49.	46.8	40.5	10
28	30.08	29.57	29.807	63.	2 P	38.	4 A	50.5	50.5	51.8	3
29	29.76	29.55	29.634	56.	7 A	37.	12 P	46.5	48.6	41.3	2
30	30.14	29.76	29 954	49.	3 P	25.	6 A	37.	36.4	31.5	6
31	30.30	30.14	30.265	52.	3 P	20.5	6 A	46.2	37.	34.5	6

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	TOTAL IN INCHES. SNOW.
1	45.7	.684	49.3	N.W.	101	4.	28	9-30 P	9 P		T.	
2	34.3	.370	60.	E.	235	4.5	30	10 A				
3	35.3	.342	72.3	S.W.	24	0.	0					
4	37.7	.449	67.7	S.	25	0.	0					
5	41.	.462	71.3	S.	93	2.5	22	3 P				
6	49.3	.448	83.	S.W.	155	3.	24	1 P				
7	45.	.382	83.7	N.	56	2.5	22	10 P				
8	36.3	.364	65.	E.	127	2.5	22	11 P				
9	34.7	.394	54.7	W.	273	10.	45	9 A				
10	27.3	.281	60.7	S.	60	0.	0					
11	45.	.357	86.3	W.N.W	43	0.5	10	6 P				
12	62.	.592	94.7	S.	339	11.	47	12 M	5 A	4 P	0.73	
13	41.7	.440	69.	N.N.W	89	2.	20	9 A				
14	43.7	.444	73.7	S.	103	4.	28	7 P				
15	58.	.725	74.	S.S.E.	144	2.	20	4 P				
16	58.3	.873	60.3	S.S.W.	176	8.5	41	10 P				
17	26.3	.304	49.7	N.W.	327	11.5	48	4 A				
18	31.7	.307	62.	S.S.W.	71	1.5	17	4 P				
19	39.3	.344	70.7	S.S.W.	43	0.5	10	11 A				
20	41.3	.371	74.3	N.N.E.	138	2.	20	12 P				
21	32.3	.318	60.3	N.N.E.	292	5.	32	10 A				
22	31.	.274	68.	N.W.	93	0.5	10	9 A				
23	30.7	.289	69.	W.S.W.	39	0.	0					
24	36.3	.270	84.	W.	48	0.	0					
25	39.	.437	58.7	N.	194	2.5	22	2 P				
26	41.7	.401	72.	N.	183	3.	24	9 A				
27	31.7	.370	63.	W.S.W.	79	0.5	10	2				
28	48.3	.430	83.3	S.S W.	76	1.5	17	5				
29	31.3	.356	51.	N.N.W	230	4.5	30	10 A				
30	24.3	.216	68.3	N.N.W.	100	2.	20	10 A				
31	28.	.257	69.3	S.	82	2.	20	7 P				

*At base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for the month has been unusually clear and dry. On but two days has rain been observed, and on one of those but a trace was recorded. The total precipitation of 0.73 inches on the 12th is only about one-sixth of the average for October. While the weather was threatening at other times and rain fell in other parts of the state, this station escaped with an overcast sky. The heavy rains of the summer have been more than offset by the September and October weather and the ground is very dry. A considerable rainfall is needed before cold weather sets in.

The temperature for the month has been slightly above the average and the mean daily range unusually high.

The large percentage of sunshine has given us a highly colored foliage during the month and beautiful tints have been unusually noticeable.

The weather has been favorable for most of the farm work of the season except plowing.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 107. NOVEMBER, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.29, 28th, 11 A.
Minimum reduced to freezing, 28.82, 9th, 7 P.
Reduced† maximum reading, 30.60, 28th, 11 A.
Reduced† min. reading, ... 29.12., 9th, 7 P.
Mean reduced†, ... 30.034
Monthly range, ... 1.47

****Air Temperature.*** In Degrees Fahr.

Highest, ... 63.0; 4th, 3 P.
Lowest, ... 5.0, 24th, 6 A.
Mean, ... 36.9
Mean of means of max. and min., ... 36.2
Mean sensible (wet bulb), ... 35.3
Monthly Range, ... 58.0
Highest mean daily, ... 53.2, 26th
Lowest mean daily, ... 21.2, 24th
Mean maximum, ... 44.7
Mean minimum, ... 27.7
Mean daily range, ... 17.0
Greatest daily range, ... 34.0, 27th
Least daily range, ... 3.5, 19th

Humidity.

Mean dew point, ... 31.8
Mean force of vapor, ...239
Mean relative humidity, ... 83.2

Wind.

Prevailing Direction, West.

Summary.

South,	17	per cent.
South West,	10	" "
North West,	23	" "
West,	13	" "
North,	13	" "
Other directions,	24	" "

Total movement, ... 4558 m.
Greatest daily movement, . . . 331 m., 27th
Least daily movement, ... 12 m., 15th
Mean daily movement, ... 151.9 m.
Mean hourly velocity, ... 6.3 m.
Maximum pressure per square foot, 20 lbs.= 63 m. per hour, 11 P., 9th, W.

Precipitation. In inches.

Total precipitation, ... 5.85
Number of days on which .01 inch or more rain or melted snow fell, ... 19

Weather.

Mean cloudiness observed, . . 71.4 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 203 hours or 69.3 per cent.
Number of clear days, ... 2
Number of fair days, ... 9
Number of cloudy days, ... 19

Bright Sunshine.

Number of Hours recorded, 90 hours or 30.7%

Rain, 1st, 2d, 3d, 8th, 9th, 11th, 12th, 15th, 16th, 17th, 19th, 20th, 21st, 22d, 23d, 25th, 26th, 27th, 29th.

Snow, 12th, 17th, 20th, 23d, 29th.

Hail, 8th, 25th.

Gales, of 35 or more miles per hour, 35m., 6th, W.N.W.; 41m., 7th, W.N.W.; 63 m., 9th, W.; 35m., 10th, N.W.; 37m., 12th, W.N.W.; 44m., 13th, N.W.; 35m., 16th, S.S.W.; 36m., 17th, N.W.; 46m., 26th, S.S.W.; 35m., 27th, N.W.; 36m., 29th, N.W.; 37m., 30th, N.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.25	29.75	30.008	55.	10 P	39.	0 A	47.	47.2	48.3	0
2	29.77	29.61	29.700	55.	0 A	45.	12 P	50.	49.9	50.	0
3	30.11	29.60	30.822	53.	1 P	36.	12 P	44.5	44.3	41.5	2
4	30.26	30.11	30.214	63.	3 P	30.	5 A	46.5	45.9	43.7	10
5	30.22	29.94	30.097	58.	2 P	31.5	4 A	44.7	46.7	47.2	3
6	29.94	29.75	29.826	63.	12 M	42.	12 P	52.5	52.8	47.7	2
7	29.97	29.89	29.941	50.	1 P	33.	12 P	41.5	42.2	37.	5
8	29.98	29.74	29.883	40.	3 P	26.	6 A	33.	34.	34.	0
9	29.74	29.12	29.329	46.	3 P	36.	5 A	41.	38.8	39.2	0
10	29.96	29.31	29.806	47.	2 P	27.	12 P	37.	38.3	36.	8
11	29.98	29.44	29.793	42.	6 P	22.5	5 P	32.2	33.3	33.7	0
12	29.64	29.37	29.485	42.	2 P	32.	3 A	37.	38.1	36.5	0
13	29.95	29.64	29.839	40.	10 A	35.	12 P	37.5	37.8	34.	4
14	30.26	29.95	30.170	41.5	3 P	26.	12 P	33.8	33.9	31.	7
15	30.31	30.22	30.278	36.	1 P	25.	1 A	30.5	33.	32.5	0
16	30.22	29.84	29.974	61.	3 P	34.	1 A	47.5	45.5	46.3	3
17	30.37	30.05	30.307	39.	1 A	28.	12 P	33.5	35.6	29.8	3
18	30.43	30.34	30.380	37.	12 M	19.	6 A	28.	28.8	27.	5
19	30.35	30.21	30.270	28.5	9 A	25.	6 A	26.8	27.4	27.5	0
20	30.28	30.14	30.227	29.5	3 P	24.	5 A	26.7	28.4	28.5	0
21	30.14	29.75	29.843	46.	12 P	29.	6 A	37.5	35.4	35.7	0
22	30.10	29.83	30.022	47.5	1 A	27.	12 P	37.3	35.1	29.5	4
23	30.24	29.85	29.960	31.5	1 P	15.	12 P	23.3	24.1	22.	5
24	30.45	30.24	30.419	33.	3 P	5.	6 A	19.0	21.2	21.	6
25	30.43	30.30	30.386	39.	12 P	25.	1 A	32.0	34.5	32.8	1
26	30.30	29.82	30.029	59.	12 P	37.	1 A	48.0	53.2	54.5	0
27	30.48	29.79	30.129	59.	1 A	25.	12 P	42.	42.0	35.5	7
28	30.60	30.48	30.575	37.	3 P	17.5	5 A	27.3	26.8	25.0	8
29	30.57	30.01	30.177	34.	9 P	19.	3 A	26.5	28.8	29.8	0
30	30.23	30.05	30.132	30.	1 P	16.	12 P	23.	25.2	22.5	7

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	TOTAL IN INCHES. SNOW.
1	48.	.349	97.3	W.	52	0.	—	—	5 A	12 P	.78	
2	50.	.361	100.	N.	153	1.	14	7 A	0 A	12 P	1.55	
3	37.3	.294	79.	N.W.	101	5.	32	12 M	0 A	9 A	.01	
4	39.7	.359	75.	S.	75	1.	14	7 P				
5	45.7	.363	88.	S.	90	1.5	17	8 P				
6	43.	.397	73.7	W.	23	6.	35	4 P				
7	28.7	.270	62.	N.W.	74	8.5	41	4 A				
8	32.7	.205	93.	W.	57	1.5	17	4 P	2 P	12 P	.02	
9	37.3	.252	89.7	W.	113	20.	63	11 P	0 A	6 P	.46	
10	25.3	.222	65.	W.N.W	282	6.	35	12 M				
11	31.3	.209	89.	S.	78	4.	29	6 P	1-30 P	12 P	.33	
12	33.3	.238	80.	N.W.	269	7.	37	1 P	0 A	7 A	.68	.5
13	29.	.223	71.3	N.W.	287	9.5	44	7 A				
14	25.3	.198	72.7	W.S.W.	206	4.	28	12 M				
15	29.3	.196	86.	S.E.	12	0.	—	—	8 A	12 P	.18	
16	44.	.366	83.7	S.W.	100	6.	35	7 P	0 A	12 P	.23	
17	20.3	.199	57.7	N.W.	182	6.5	36	3 A	0 A	5 A	.03	T.
18	24.7	.160	88.	N.W.	90	4.	28	2 P				
19	26.7	.152	96.3	S.W.	41	0.	—	—	9 A	12 P		* *
20	28.3	.157	100.	N.	71	0.	—	—	0 A	12 M	.22	1.5
21	34.3	.213	95.3	S.W.	52	5.	32	11 P	11 A	9 P	.02	
22	19.7	.193	62.	N.	221	5.	32	6 A	8 P	12 P		* *
23	21.3	.124	96.7	W.N.W	103	3.5	27	2 P	0 A	3 A	.23	1.75
24	18.	.127	89.7	S.	114	3.	25	10 P				
25	28.3	.209	75.7	S.	292	5.5	34	4 A	11 A	12 P	.33	
26	53.7	.439	95.	S.S.E.	320	10.5	46	7 P	0 A	12 P	.06	
27	29.	.253	67.3	N.W.	331	6.	35	9 A	0 A	8 A	.58	
28	20.7	.150	80.7	N.E.	136	0.5	10	9 A				
29	29.	.169	95.	N.	55	6.5	36	10 P	10 A	6 P	.14	.5
30	21.	.127	91.3	N.N.W.	178	7.	37	1 P				

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

While the weather for the month presents no especially marked features it may be said that on the whole it has been quite unpleasant. The atmospheric pressure has fluctuated more than usual, some considerable changes being noted in comparatively short periods. The minimum reading for the 9th is the lowest recorded here so far this year.

The monthly range of temperature is above the average for November, and the minimum for the month (5 degrees on the 24th) is the lowest since 1891. The rapid rise in temperature from the 24th to the 26th is also worthy of note. The wind movement is slightly above the average and characterized by an unusual number of gales of 35 or more miles per hour. The relative humidity is about 10 per cent above the average.

Snow has fallen on a number of days but the amounts have been small and it has soon melted. The precipitation is about an inch above the average. The small percentage of sunshine and the number of days on which rain fell indicate clearly the character of the weather for the month.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 108. DECEMBER, 1897.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, . 30.28, 3d, 10A.
Minimum reduced to freezing, 28.86, 31st, 12 P.
Reduced† maximum reading, . 30.60, 3d, 10A.
Reduced† min. reading, . . . 29.18., 31st, 12 P.
Mean reduced†, ... 30.036
Monthly range, ... 1.42

****Air Temperature.*** In Degrees Fahr.

Highest, ... 59.0; 11th, 3 P.
Lowest, ... -3.5, 29th, 5 A.
Mean, ... 28.8
Mean of means of max. and min., ... 28.3
Mean sensible (wet bulb), ... 28.2
Monthly Range, ... 62.5
Highest mean daily, ... 50.5, 11th
Lowest mean daily, ... 10.7, 24th
Mean maximum, ... 35.3
Mean minimum, ... 21.3
Mean daily range, ... 14.0
Greatest daily range, ... 30.5, 29th
Least daily range, ... 4.0, 8th

Humidity.

Mean dew point, ... 24.2
Mean force of vapor, ...175
Mean relative humidity, ... 83.9

Wind.

Prevailing Direction, West North West.

Summary.

North North West, ... 13 per cent.
South South West, ... 13 " "
West North West, ... 16 " "
North West, ... 19 " "
North, ... 10 " "
Other directions, ... 29 " "

Total movement, ... 4068 m.
Greatest daily movement, . . . 340 m., 18th
Least daily movement, ... 28m., 9th
Mean daily movement, ... 131.2 m.
Mean hourly velocity, ... 5.5 m.
Maximum pressure per square foot, 12 lbs=. 49 m. per hour, 8 A., 18th, W.N.W.

Precipitation. In inches.

Total precipitation, ... 7.23
Number of days on which .01 inch or more rain or melted snow fell, ... 12
Snow total in inches, ... 9.5

Weather.

Mean cloudiness observed, . . 68.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 175 hours or 65.0 per cent.
Number of clear days, ... 6
Number of fair days, ... 7
Number of cloudy days, ... 18

Bright Sunshine.

Number of Hours recorded, 108 hours or 35%
Rain, 4th, 5th, 12th, 14th, 15th, 17th.
Snow, 1st, 3d, 7th, 18th, 20th, 21st, 26th, 29th, 31st.
Hail, 17th.
Aurora, 21st.
Gales, of 35 or more miles per hour, 40m., 2d, W.N.W.; 47m., 5th, W.N.W.; 44 m., 17th, W.; 49m., 18th, W.N.W.; 41m., 21th, W.N.W.; 35m., 27th, W.N.W.

* Temperature in ground shelter.
† Reduced to freezing and sea level.
* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.24	30.02	30.102	33.	3 P	16.	0 A	24.5	27.9	28.2	0
2	30.57	30.07	30.435	35.	1 A	19.	12 P	27.	27.3	24.5	6
3	30.60	30.46	30.537	27.	3 P	19.	6 A	23.	23.8	24.2	0
4	30.46	29.74	30.118	31.	9 P	22.5	6 A	26.7	27.6	27.6	0
5	29.78	29.44	29.588	43.5	1 P	30.	3 A	36.7	36.4	34.0	4
6	30.24	29.78	30.104	35.5	1 A	23.5	11 P	29.5	31.0	27.3	9
7	30.24	30.14	30.167	29.	2 P	22.	6 A	25.5	26.6	27.3	0
8	30.30	30.17	30.251	31.	2 P	27.	5 A	29.	29.5	28.8	0
9	30.33	30.29	30.305	37.	2 P	28.	12 P	32.5	32.0	32.8	0
10	30.30	30.07	30.173	52.5	4 P	28.	0 A	40.3	41.9	44.	3
11	30.07	29.79	29.851	59.	3 P	43.	3 A	51.	50.5	49.7	4
12	29.98	29.77	29.851	42.	5 A	32.	12 P	37.	40.5	38.7	2
13	30.35	29.98	30.210	43.	3 P	29.	6 A	36.	35.0	32.7	5
14	30.35	29.70	30.109	39.	11 P	32.	1 A	35.5	37.1	36.3	0
15	29.77	29.51	29.595	48.5	3 P	39.	0 A	43.8	42.7	42.2	1
16	30.07	29.77	29.937	50.5	2 P	36.5	8 A	43.5	43.4	40.2	3
17	30.26	29.85	30.090	46.	3 P	30.5	6 A	38.3	40.6	34.5	5
18	30.21	29.84	30.091	41.	1 A	21.	12 P	31.	29.8	24.8	6
19	30.40	30.21	30.336	24.5	3 P	11.	12 P	17.8	16.9	13.7	9
20	30.42	29.83	30.178	20.	3 P	7.5	5 A	13.7	15.2	15.3	0
21	29.90	29.71	29.770	33.	1 P	17.5	12 P	25.3	23.6	24.	2
22	29.90	29.69	29.788	29.5	3 P	13.5	5 A	21.5	21.4	22.	3
23	29.69	29.54	29.603	29.5	12 M	17.5	12 P	23.5	22.9	21.3	3
24	30.27	29.64	30.042	14.5	1 A	6.	12 P	10.2	10.7	8.3	9
25	30.36	30.03	30.175	25.	2 P	1.	5 A	13.0	15.2	15.3	9
26	30.03	29.82	29.884	27.	2 P	20.	12 P	23.5	24.2	24.8	0
27	30.17	29.81	29.986	32.	12 M	18.	2 A	25.	23.5	21.9	5
28	30.39	30.17	30.364	29.	3 P	6.	7 A	17.5	15.4	12.6	9
29	30.37	29.87	30.180	27.	2 P	-3.5	5 A	11.8	14.3	14.5	9
30	29.87	29.68	29.725	43.	2 P	20.	1 A	31.5	34.0	34.4	3
31	28.93	29.18	29.568	36.	1 A	30.	12 P	33.	32.2	28·3	0

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	26.3	.160	94.3	S.	109	2.	20	4 P	9.30 A	11 A	T.	T.
2	22.0	.139	88.0	N.N.W.	160	8.	40	4.30 A				
3	22.7	.134	92.0	N.N.W.	50	2.	20	4 P	8 A	12 P	* *	* *
4	27.0	.153	98.0	N.W.	50	0.	—	—	0 A	12 P	.55	
5	29.0	.221	75.0	W.N.W	162	11.	47	12 M	0 A	10 A	.52	
6	21.3	.169	72.0	N.	191	2.	20	8 A				
7	26.7	.151	96.0	N.N.W.	74	0.	—	—	8 A	12 P	.13	1.
8	29.3	.166	98.3	S.S.W.	34	0.	—	—				
9	32.7	.187	100.	W.S.W.	28	0.	—	—				
10	43.3	.298	96.3	S.E.	73	2.	20	12 P				
11	48.0	.383	89.7	S.S.W.	274	5.	32	10 A				
12	36.7	.244	90.0	N.	128	1.	14	2 P	7 A	2 P	.57	
13	27.3	.207	78.7	N.	127	2.	20	9 A				
14	34.7	.225	88.7	N.N.E.	154	2.5	22	9 A	10 A	12 P	3.25	
15	41.0	.274	96.0	N.W.	115	2.	20	12 P	0 A	12 M	.83	
16	35.7	.256	74.0	W.	176	3.	25	10 A				
17	26.0	.248	61.3	S.S.W.	157	9.5	44	4 A	4.30 P	12 P	.03	
18	17.0	.155	63.3	W.N.W	340	12.	49	8 A	11 A			T.
19	6.3	.099	65.3	N.W.	243	3.5	26	1 P				
20	13.0	.128	88.7	N.W.	94	1.5	17	5 A	5.30 P	11 P	.19	1.
21	22.7	.135	94.3	N.N.W.	89	2.	20	12 M	11 A	8 P		T.
22	19.3	.126	88.3	W.N.W	18	0.	—	—				
23	16.7	.126	76.7	W.N.W	94	4.	28	11 P				
24	0.7	.073	67.7	W.N.W	282	8.5	41	12 M	11 A			
25	9.7	.103	72.3	S.	154	4.	28	8 P				
26	23.0	.138	91.3	S.W.	119	2.	20	0 A	10-30 A	3 P	.02	.5
27	16.3	.132	71.0	W.	167	6.	35	11 A				
28	8.7	.088	81.7	N.W.	82	2.5	23	0 A				
29	11.0	.102	83.0	S.S.W.	56	1.	14	6 P	9 P	12 P	.14	.1
30	29.3	.224	75.7	S.W.	162	3.	24	11 A				
31	30.3	.181	94.7	N.W.	106	4.5	30	11 P	11 A	12 P	1.00	6.

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

Annual Summary for 1897.

Pressure. In inches.

Maximum reduced to freezing,	30.54 Mar. 1st, 7 A.
Minimum reduced to freezing,	28.82 Nov. 9th, 7 P.
Maximum reduced to freezing and sea-level,	30.88 Mar. 1st, 7 A.
Minimum reduced to freezing and sea-level,	29.12 Nov. 9th, 7 P.
Mean reduced to freezing and sea-level,	30.014
Annual range,	1.76

****Air Temperature.*** In degrees Fahr.

Highest,	91.5 Sept. 10th
Lowest,	-11. Feb. 1st
Mean,	46.6
Mean of means of max. and min.,	46.8
Mean sensible (wet bulb),	43.7
Annual range,	102.5
Highest mean daily,	78.1 July 9th
Lowest mean daily,	5.0 Jan. 19th
Mean maximum,	57.1
Mean minimum,	36.5
Mean daily range,	20.6
Greatest daily range,	47.0 Oct. 4th
Least daily range,	3.5 Nov. 19th

Humidity.

Mean dew point,	39.6
Mean force of vapor,	.402
Mean relative humidity,	76.4

Wind.

Prevailing Direction, West, or S. 79° W.

Summary.

South,	19 per cent.
North West,	12 " "
West,	11 " "
North,	10 " "
South South West,	8 " "
West North West,	8 " "
North North West,	7 " "
South West,	7 " "
Other Directions,	18 " "
Total movement,	54,220 m.
Greatest daily movement,	400m. Jan. 26, Feb. 3
Least daily movement,	11m. Feb. 1
Mean daily movement,	146.8 m.
Mean hourly velocity,	6.1

Maximum pressure per square foot 22 lbs.= 66m. per hour on May 10th, 2 P. W.S.W.

* Temperature in ground shelter.

Precipitation. In inches.

Total precipitation, rain or melted snow	57.05
Number of days on which .01 or more rain or melted snow fell,	127
Snow total in inches,	52.8

Weather.

Mean cloudiness observed,	51.4%
Total cloudiness recorded by Sun Thermometer,	2209 hours=50.5%
Number of clear days,	108
Number of fair days,	109
Number of cloudy days,	148

Bright Sunshine.

Number of hours recorded, 2325 hours=50.1%

Dates of Frosts.

Last,	May 8th
First,	Sept. 22d

Dates of Snow.

Last,	April 27th
First,	Nov. 12th
Total days of sleighing,	38

Gales of 50 or More Miles Per Hour.

Jan. 18th, 61m. W.; 23d, 55m. W.N.W.; 25th, 52m. W.N.W.; 26th, 55m. N.N.W.

March 4th, 51m. N.W.; 13th, 51m. W.N.W.; 15th, 52m. W.N.W.

April 19th, 53m. N.W.

May 10th, 66m. W.S.W.

Aug. 15th, 53m. S.S.W.

Sept. 26th, 64m. N.W.

Nov. 9th, 63m. W.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 109. JANUARY, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.27, 19th, 10A
Minimum reduced to freezing, . 28.86, 1st, 0 A.
Reduced† maximum reading, 30.61, 19th, 0A.
Reduced† min. reading, ... 29.18., 1st, 0A.
Mean reduced†, ... 29.976
Monthly range, ... 1.41

**Air Temperature.* In Degrees Fahr.

Highest, ... 50.0; 13th, 10 A.
Lowest, ... -15.5, 30th, 6 A.
Mean, ... 21.8
Mean of means of max. and min., ... 21.8
Mean sensible (wet bulb), ... 21.4
Monthly Range, ... 65.5
Highest mean daily, ... 37.8, 21st
Lowest mean daily, ... -2.0, 30th
Mean maximum, ... 31.4
Mean minimum, ... 12.2
Mean daily range, ... 19.2
Greatest daily range, ... 37.0, 31st
Least daily range, ... 4.0, 22d

Humidity.

Mean dew point, ... 18.4
Mean force of vapor, ...159
Mean relative humidity, ... 85.2

Wind.

Prevailing Direction, North West.

Summary.

North North West, ... 16 per cent.
South West, ... 10 " "
West North West, ... 10 " "
North West, ... 23 " "
North, ... 10 " "
Other directions, ... 31 " "

Total movement, ... 3494 m.
Greatest daily movement, . . . 317 m., 24th
Least daily movement, ... 4m., 18th
Mean daily movement, ... 113.0 m.
Mean hourly velocity, ... 4.7 m.
Maximum pressure per square foot, 22.5 lbs = 67 m. per hour, 12 M., 3d, N.W.

Precipitation. In inches.

Total precipitation, ... 7.15
Number of days on which .01 inch or more rain or melted snow fell, ... 13
Snow total in inches, ... 33

Weather.

Mean cloudiness observed, . . 66.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 162 hours or 55.0 per cent.
Number of clear days, ... 6
Number of fair days, ... 10
Number of cloudy days, ... 15

Bright Sunshine.

Number of Hours recorded, 132 hours or 45%

Rain, 6th. 7th, 12th, 13th, 14th, 15th, 20th, 23d, 25th, 26th.

Snow, 1st, 4th, 14th, 15th, 20th, 22d, 23d, 25th, 26th, 27th, 29th, 31st.

Hail, 31st.

Gales, of 35 or more miles per hour, 49m., 1st, W.N.W.; 67m., 3d, N.W ; 35 m., 7th, N W.; 47m., 8th, W S.W.; 56 m., 21th, N.W.; 47m., 31st, N.W.

Snow on ground at end of month, 15 inches.

Days of sleighing, 31 for light sleighs, 30 for heavy.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.								NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.&MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.		
1	29.82	29.18	29.562	18.	—	4.	—	11.	—	14.0		5
2	30.05	29.82	29.977	20.5	—	-5.5	—	7.5	—	6.7		9
3	30.38	29.76	29.927	24.	—	8.	—	16.	—	12.9		6
4	30.41	30.08	30.284	9.	12 P	-10.	5 A	-0.5	2.8	2.5		0
5	30.19	30.01	30.077	37.	3 P	2.	5 A	19.5	19.0	19.0		3
6	30.25	29.74	30.047	32.5	12 P	14.	5 A	23.2	24.2	25.8		0
7	30.07	29.67	29.857	39.	3 P	25.	12 P	32.	34.2	31.2		4
8	29.96	29.46	29.630	42.	4 P	23.5	1 A	32.7	34.3	32.3		2
9	30.05	29.74	30.004	36.	1 A	21.	12 P	28.5	29.8	25.7		9
10	30.10	30.01	30.054	39.	3 P	10.	8 A	24.5	23.5	23.0		9
11	30.26	30.10	30.171	41.	4 P	17.5	8 A	29.2	28.1	26.8		8
12	30.10	29.58	29.799	40.	12 P	30.	5 A	35.	34.6	35.7		0
13	30.10	29.45	29.755	50.	10 A	25.	12 P	37.5	28.0	35.2		6
14	30.28	30.10	30.208	36.	1 P	21.	4 A	28.5	29.4	28.0		2
15	30.20	29.63	29.843	33.5	2 P	27.5	4 A	30.5	31.2	31.8		0
16	30.09	29.63	29.910	35.5	7 A	20.	12 P	27.7	29.7	28.2		6
17	30.50	30.09	30.374	25.	4 P	7.	12 P	16.	15.6	14.3		9.5
18	30.54	30.43	30.485	32.	4 P	0.5	7 A	16.2	13.5	13.8		7
19	30.61	30.39	30.476	31.	3 P	3.5	6 A	17.2	17.9	18.2		7
20	30.39	29.57	29.851	33.5	2 P	17.5	0 A	25.5	29.1	30.3		0
21	30.25	29.61	30.028	42.5	6 A	33.	1 P	37.7	37.8	35.2		0
22	30.38	30.04	30.260	36.	10 A	32.	10 P	34.	34.3	32.3		0
23	30.04	29.23	29.341	42.	2 P	31.	5 A	36.5	35.3	35.8		2
24	30.19	29.36	29.944	36.	1 A	21.	12 P	28.5	29.5	25.5		6
25	30.29	29.56	30.049	28.	4 P	9.	7 A	18.5	20.3	18.7		6
26	29.73	29.32	29.502	34.	3 P	18.	12 P	26.	25.7	26.2		2
27	29.84	29.73	27.789	32.	3 P	5.	8 A	18.5	17.2	14.8		7
28	30.03	29.84	29.990	16.	3 P	-1.	6 A	7.5	7.2	5.2		5
29	30.07	29.91	29.951	15.	5 P	-5.	5 A	10.	5.4	6.3		1.5
30	30.34	30.07	30 275	13.	3 P	-15.5	6 A	-1.2	-2.0	-3.4		10
31	30.28	29.12	29.826	25.	12 P	-12.	1 A	6.5	7.5	10.8		0

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	SNOW.
1	11.3	.089	86.7	N.W.	174	12.	49	9 A	0 A	4 A	.29	3.
2	6.0	.067	92.7	S.W.	94	2.5	22	1 A				
3	7.0	.089	71.0	W.	266	22.5	67	12 M				
4	0.7	.054	92.7	N.N.W.	37	0.5	10	2 A	2.30 P	12 P	.31	4.
5	16.3	.123	84.7	W.	73	4.	28	5 P				
6	25.3	.146	99.0	S.W.	65	0.5	10	1 A	8 P	12 P	.33	
7	24.0	.206	65.7	N.W.	206	6.	35	2 P	0 A	4 A	.33	
8	26.3	.210	70.3	W.S.W.	264	11.	47	6 P				
9	19.3	.160	69.3	W.N.W	176	4.5	30	1 A				
10	20.0	.143	84.3	W.S.W.	15	0.	—	—				
11	22.7	.167	78.3	W.N.W	18	0.	—	—				
12	35.7	.210	100.	S.S.E.	69	1.5	17	6 P	11 A	12 P	.18	
13	31.0	.232	78.3	N.W.	222	5.	32	11 A	0 A	3 A	.05	
14	23.7	.169	75.0	W.N.W	81	2.	20	1.30 P	10 A		T.	T.
15	31.7	.179	100.	S.W.	100	0.	—	—	6.30 A	11 P	.65	3.
16	23.7	.173	75.0	N.W.	141	3.	24	9 A				
17	11.7	.091	88.0	N.N.E.	67	1.	14	9 A				
18	11.3	.094	88.7	S.E.	4	0.	—	—				
19	15.7	.114	88.0	S.	8	0.	—	—				
20	30.3	.170	100.	N.	47	1.	14	4 P	3 A	8 P	1.64	3.
21	30.0	.230	73.3	N.W.	173	5.5	33	8 A				
22	29.7	.192	87.7	S.S.E.	76	0.5	10	7 P	8 P	12 P	* *	* *
23	33.3	.223	87.0	N.E.	130	5.	32	12 P	0 A	6 P	1.23	4.
24	19.0	.157	68.7	N.W.	317	16.	56	5 P				
25	16.0	.112	87.3	N.N.W.	57	0.	—	—	6 P	12 P	* *	* *
26	23.7	.149	88.7	N.N.W.	246	3.	24	11 A	0 A	5 P	.58	5.
27	11.3	.099	83.0	N.W.	58	2.	20	3 P	3 A			T.
28	1.0	.062	82.0	N.	96	2.	20	3 A				
29	5.3	.063	92.7	N.	46	0.	—	—	8 A	2.30 P		T.
30	-5.0	.043	92.0	N.N.W.	49	0.	—	—				
31	10.7	.082	100.	N.N.W.	119	11.	47	11 P	4 A	12 P	1.56	11.

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for January has been with but little exception good winter weather, and presents a few features worthy of note.

Although the range of the barometer has been about normal, a number of rather rapid fluctuations of nearly an inch occurred during the last third of the month. The mean temperature has been about one degree below the normal for January, and the range somewhat greater than usual. The minimum for the month (—15.5° F. on the 30th) is the lowest recorded here since this station was established in 1889.

The wind movement has been considerably less than the average although several gales have been recorded. The precipitation has been about twice the usual amount and the snowfall very large.

Sleighing for the season began on the 1st, and has been good during the whole month with the exception of a single day. The month closed with 15 inches of snow on the ground and snow falling with every indication of a severe storm.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 110. FEBRUARY, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.31, 4th, 10A.
Minimum reduced to freezing, 28.69, 16th, 10A.
Reduced† maximum reading, 30.64, 4th, 10A.
Reduced† min. reading, . . . 29.01., 16th, 6A.
Mean reduced†, ... 30.052
Monthly range, ... 1.63

**Air Temperature.* In Degrees Fahr.

Highest, ... 54.0; 10th, 3 P.
Lowest, ... -19.0, 3d, 6 A.
Mean, ... 26.3
Mean of means of max. and min., ... 26.0
Mean sensible (wet bulb), ... 25.3
Monthly Range, ... 73.0
Highest mean daily, ... 38.5, 10th
Lowest mean daily, ... -0.6, 3d
Mean maximum, ... 35.9
Mean minimum, ... 16.2
Mean daily range, ... 19.7
Greatest daily range, ... 40.0, 3d
Least daily range, ... 6.0, 12th, 22d

Humidity.

Mean dew point, ... 21.8
Mean force of vapor, ...161
Mean relative humidity, ... 83.1

Wind.

Prevailing Direction, West.

Summary.

North North East, ... 14 per cent.
South West, ... 11 " "
South South West, ... 11 " "
North West, ... 21 " "
West, ... 21 " "
Other directions, ... 22 " "

Total movement, ... 3699 m.
Greatest daily movement, ... 448 m., 1st
Least daily movement, ... 8 m., 7th
Mean daily movement, ... 132.1 m.
Mean hourly velocity, ... 5.5 m.
Maximum pressure per square foot, 15.5 lbs = 56 m. per hour, 5 P., 16th, N.W.

Precipitation. In inches.

Total precipitation, ... 3.80
Number of days on which .01 inch or more rain or melted snow fell, ... 9
Snow total in inches, ... 15

Weather.

Mean cloudiness observed, . . 64.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 158 hours or 53.0 per cent.
Number of clear days, ... 7
Number of fair days, ... 7
Number of cloudy days, ... 14

Bright Sunshine.

Number of Hours recorded, 138 hours or 47%

Rain, 5th, 12th, 18th, 19th, 20th, 21st, 22d.

Snow, 1st, 14th, 15th, 19th, 20th, 21st, 22d, 23d, 24th, 26th.

Hail, 14th, 19th, 20th, 21st.

Gales, of 35 or more miles per hour, 45m., 1st, N.N.E.; 56m., 16th, N.W.; 40 m., 21st, N.N.E.

Snow on ground at end of month, 8 inches.
Days of sleighing, ... 28

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.								NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	29.76	29.12	29.416	25.0	1 A	10.	12 P	17.5	16.2	16.2	4
2	30.14	29.76	30.047	13.	3 P	−6.5	6 A	3.2	2.2	2.0	5
3	30.47	30.14	30.327	21.	1 P	−19	6 A	1.0	−0.6	−1.4	10
4	30.64	30.47	30.597	26.	3 P	−5.	6 A	10.5	10.5	11.0	10
5	30.57	30.10	30.270	34.	9 P	−2.	3 A	16.0	18.9	22.4	1
6	30.33	30.10	30.238	35.5	1 P	15.	12 P	25.2	28.7	24.5	10
7	30.37	30.22	30.344	42.	3 P	2.5	5 A	22.2	20.4	19.8	10
8	30.42	30.35	30.374	41.	3 P	13.	5 A	27.0	27.4	28.0	4
9	30.38	30.26	30.307	43.	3 P	26.	8 A	34.5	34.1	33.0	3
10	30.35	30.18	30.234	54.	3 P	30.	7 A	42.0	38.5	37.8	9
11	30.46	30.27	30.363	42.	1 A	27.	3 A	34.5	34.9	34.5	0
12	30.27	29.93	30.021	41.	6 P	35.	4 A	38.0	38.1	37.5	0
13	30.17	30.05	30.109	47.5	1 P	24.	12 P	35.7	37.4	31.2	9
14	30.10	29.81	29.900	41.	1 P	13.5	6 A	27.2	28.2	27.7	5
15	29.86	29.20	29.597	34.	12 M	19.	7 A	26.5	28.2	26.8	2
16	29.67	29.01	29.314	30.	1 P	10.	12 P	20.0	18.7	16.5	1
17	30.25	29.67	30.024	29.5	12 M	4.5	7 A	17.0	16.7	14.5	10
18	30.25	30.18	30.203	31.	4 P	8.	4 A	19.5	22.8	24.3	1
19	30.36	30.20	30.308	41.	2 P	27.5	4 A	34.2	34.6	34.2	2
20	30.35	30.10	30.198	34.	1 A	26.5	12 P	30.2	30.2	29.5	0
21	30.10	29.76	29.895	36.	9 P	27.	0 A	31.5	32.8	33.8	0
22	29.88	29.77	29.829	37.	9 P	31.	9 A	34.0	34.0	33.5	2
23	29.89	29.81	29.838	41.	3 P	32.	12 P	36.5	34.7	33.5	3
24	29.96	29.89	29.943	40.	4 P	27.5	6 A	33.7	35.0	32.2	7
25	29.97	29.88	29.926	39.	1 P	24.	5 A	31.5	31.7	29.8	6
26	29.99	29.92	29.968	33.5	2 P	19.5	7 A	26.5	27.1	25.0	5
27	30.00	29.95	29.982	38.5	1 P	17.5	5 A	28.0	28.8	27.7	8
28	29.98	29.85	29.899	34.5	4 P	16.5	6 A	25.5	26.3	24.5	11

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	13.0	.098	85.0	W.N.W.	448	10.	45	2 A	0 A	11 A	.44	2.
2	−2.7	.053	79.0	W.	120	1.5	17	2 A				
3	−4.0	.051	87.0	W.	99	1.5	17	5 P				
4	6.0	.086	76.3	S.S.W.	86	1.	14	2 A				
5	21.3	.135	94.7	W.	36	0.	—	—	1.30 P	10 P	.12	
6	17.0	.156	68.0	N.N.E.	166	4.5	30	1 P				
7	15.0	.135	76.7	S.S.E.	8	0.	—	—				
8	23.7	.179	78.0	S.S.W.	37	1.5	17	4 P				
9	29.3	.207	83.3	S S.E.	28	0.5	10	10 A				
10	33.7	.265	78.7	W.	62	0.5	10	1 P				
11	31.0	.216	84.7	S.W.	70	3.5	26	8 P				
12	35.3	.234	90.0	S.W.	167	4.5	30	9 P	6 A	12 P	.30	
13	21.0	.222	54.0	N.W.	144	2.5	23	1 A				
14	23.7	.177	78.7	W.	46	1.	14	9 P	3 P	9 P	T.	T.
15	25.3	.150	96.0	S.W.	56	0.5	10	10 P	12.30 P	12 P	.60	5.
16	15.3	.100	94.0	N.W.	328	15.5	56	5 P				
17	8.7	.099	76.0	N.W.	258	5.5	33	7 A				
18	23.3	.138	95.0	N.W.	18	0.	—	—	2 P	6 P	T.	
19	31.0	.213	84.0	N.N.E.	99	1.5	17	5 P	9 P	12 P	* *	* *
20	29.3	.163	100.	N.N.E	231	1.5	17	7 A	0 A	12 P	* *	* *
21	33.7	.194	100.	N.N.E.	325	8.	40	10 A	0 A	12 P	2.11	7.
22	31.7	.201	89.3	N.	249	4.5	30	3 A	0 A	2.30 P	.22	1.
23	31.7	.179	88.0	W.	63	1.5	17	6 P	11 A			T.
24	29.0	.196	86.0	S.S.W.	108	1.5	17	9 P	8 P		.01	T.
25	25.7	.183	78.0	W.S.W.	124	2.	20	1 P				
26	21.3	.148	79.7	W.N.W.	99	2.	20	2 P	11 A	2 P		T.
27	22.7	.170	77.0	N.W.	116	2.	20	3 P				
28	18.7	.150	71.3	N.W.	108	2.5	23	10 A				

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The month of February has presented a rather remarkable variety of weather and an unusual range of temperature. Beginning with a severe snow storm in progress and low temperature, the cold increased until 19° below zero was reached on the morning of the 3rd. A high wind on the 1st drifted the snow so that the roads were impassible for a time, and traffic at a standstill. The storm was probably the most severe in this section since 1888. The first week of the month was followed by a week of rather warm weather and this by a period of unusually cloudy and stormy weather from the 18th to the 24th. The month closed with a few bright days of good winter weather. Notwithstanding some exceptionally cold weather the mean temperature for the month was over a degree above the normal. The relative humidity considerably above the average.

The total wind movement was nearly a thousand miles less than the average for February; the number of gales comparatively few.

The precipitation was slightly above the normal while the snowfall in inches was a little below it.

Sleighing has continued throughout the month and was in good condition when the month closed.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 111. MARCH, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.45, 26th, 7 A.
Minimum reduced to freezing, 29.28, 23d, 6 A.
Reduced† maximum reading, 30.76, 26th, 7 A.
Reduced† min. reading, . . . 29.59., 23d, 6 A.
Mean reduced†, ... 30.203
Monthly range, ... 1.17

****Air Temperature.*** In Degrees Fahr.

Highest, ... 60.0; 11th, 4 P.‡
Lowest, ... 14.5, 4th, 6 A.
Mean, ... 39.6
Mean of means of max. and min., ... 39.7
Mean sensible (wet bulb), ... 36.3
Monthly Range, ... 45.5
Highest mean daily, ... 47.6, 27th
Lowest mean daily, ... 28.6, 4th
Mean maximum, ... 50.4
Mean minimum, ... 29.0
Mean daily range, ... 21.4
Greatest daily range, ... 35.0, 9th‡
Least daily range, ... 6.5, 28th

Humidity.

Mean dew point, ... 30.5
Mean force of vapor, ...260
Mean relative humidity, ... 72.6

Wind.

Prevailing Direction, South West.

Summary.

North, ... 13 per cent.
South, ... 23 " "
WestNorth West, ... 13 " "
Other directions, ... 51 " "

Total movement, ... 3864 m.
Greatest daily movement, . . . 321 m., 31st
Least daily movement, ... 17 m., 7th
Mean daily movement, ... 125.0 m.
Mean hourly velocity, ... 5.2 m.
Maximum pressure per square foot, 15.5 lbs = 56 m. per hour, 2 P., 20th, W.

Precipitation. In inches.

Total precipitation, ... 1.63
Number of days on which .01 inch or more rain or melted snow fell, ... 9
Snow total in inches, ... 1.5

Weather.

Mean cloudiness observed, . . 53.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 171 hours or 46.0 per cent.
Number of clear days, ... 8
Number of fair days, ... 12
Number of cloudy days, ... 11

Bright Sunshine.

Number of Hours recorded, 200 hours or 54%

Rain, 3d, 4th, 12th, 13th, 16th, 17th, 19th, 22d, 23d, 27th, 28th, 29th, 31st.

Snow, 2d, 3d, 4th, 16th, 21st, 31st.

Aurora, 14th, 15th.

Gales, of 35 or more miles per hour, 37m., 13th, N.N.W.; 36m., 14th, N.W.; 37m., 17th, W.N.W.; 56m., 20th, W.; 39m., 31st, N.

Snow on ground at end of month, ... 0
Days of sleighing, ... 8

* Temperature in ground shelter.
† Reduced to freezing and sea level.
* * Determined from levels of B. & M. R. R.
‡ Other dates also.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	29.99	29.89	29.920	43.	4 P	20.	4 A	31.5	29.6	26.2	10
2	30.11	29.99	30.084	43.	1 P	15.	6 A	29.0	31.5	27.3	7
3	30.31	30.09	30.192	46.	4 P	25.	12 P	35.5	33.9	31.5	6
4	30.33	29.95	30.161	39.	3 P	14.5	6 A	26.7	28.6	27.7	2
5	30.29	29.94	30.132	40.5	12 M	23.	6 A	31.7	33.4	28.7	11
6	30.46	30.29	30.388	46.	3 P	18.	7 A	32.0	33.8	27.2	11
7	30.49	30.42	30.458	49.	1 P	16.5	6 A	32.7	32.6	29.8	7
8	30.44	30.34	30.381	55.5	3 P	27.	6 A	41.2	41.0	34.3	11.5
9	30.38	30.27	30.330	59.	3 P	24.	6 A	41.5	41.2	35.8	11.5
10	30.42	30.33	30.379	59.	4 P	24.	6 A	41.5	40.9	38.2	8
11	30.38	30.21	30.287	60.	4 P	29.5	6 A	44.7	44.0	40.7	9
12	30.21	29.99	30.069	50.	5 P	39.5	8 A	44.8	43.9	44.8	0
13	30.02	29.73	29.862	56.5	2 P	39.5	4 A	48.0	46.9	47.0	2
14	30.18	29.92	30.078	48.	2 P	34.	12 P	41.0	40.8	36.5	12
15	30.39	30.18	30.296	48.	4 P	27.	6 A	37.5	35.7	32.0	12
16	30.44	30.20	30.345	40.5	5 P	25.	3 A	32.8	34.5	34.2	3
17	30.20	29.85	29.972	57.	3 P	35.	1 A	46.0	44.4	41.7	7
18	30.27	30.11	30.225	55.5	4 P	28.5	6 A	42.0	45.0	38.5	11
19	30.16	29.78	29.890	49.	4 P	39.	11 P	44.0	42.7	43.0	0
20	30.19	29.71	29.974	53.	2 P	37.	9 P	45.0	45.7	40.8	7
21	30.26	30.17	30.194	42.5	4 P	34.	12 P	38.2	37.8	35.8	2
22	30.32	29.93	30.184	45.	12 M	24.5	6 A	34.7	32.8	28.7	2
23	30.04	29.59	29.792	55.	1 P	30.	4 A	42.5	41.4	41.1	6
24	30.26	30.04	30.194	47.	1 P	29.5	6 A	38.2	38.2	33.2	9
25	30.64	30.26	30.453	56.5	5 P	27.5	6 A	42.0	41.5	37.5	12
26	30.76	30.64	30.719	60.	3 P	25.	6 A	42.5	43.0	38.3	6
27	30.71	30.46	30.530	59.	3 P	37.5	5 A	48.2	47.6	45.0	4
28	30.51	30.39	30.454	49.	3 P	42.5	6 A	45.7	46.3	41.7	0
29	30.39	30.24	30.304	48.	2 P	40.	6 A	44.0	43.6	42.3	0
30	30.24	29.95	30.101	60.	4 P	37.	6 A	48.5	47.1	43.0	9
31	29.96	29.88	29.933	43.5	5 P	31.	12 P	37.2	37.7	33.5	2

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.				PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	SNOW.
1	18.3	.168	65.7	N.	182	3.	25	2 A				
2	20.0	.184	67.6	S.	48	1.	14	10 P	11 P	12 P		T.
3	25.0	.204	71.0	N.E.	84	1.	14	10 A	0 A	9 A	.06	0.5
4	25.3	.167	88.3	N.	85	2.5	22	11 P	5 P	12 P	.09	1.
5	19.7	.188	61.0	N.N.W.	218	4.5	30	9 A				
6	19.0	.185	63.7	S.	51	1.	14	5 P				
7	23.3	.204	71.0	S.	17	0.	—	—				
8	24.7	.262	60.3	S.	68	0.5	10	9 P				
9	27.7	.287	62.0	S S.E.	85	1.	14	9 P				
10	35.7	.264	86.0	S.S.E.	60	0.5	10	8 P				
11	37 0	.306	80.7	S.	90	3.	24	10 P				
12	44.7	.298	100.	S.	171	2.	20	6 P	4 A	12 M	.31	
13	44.3	.359	83.0	W.S.W.	207	7.	37	9 P	4 P	8 P	T.	
14	28.7	.262	63.7	W.N.W.	196	6.5	36	2 A				
15	26.0	.207	74.0	N.N.W.	170	4.	28	2 P				
16	28.7	.218	74.3	W.S.W.	143	3.	24	12 P	9.30 A		T.	T.
17	36.7	.324	72.7	W.	262	7.	37	4 P	5 A	8 A	.08	
18	26.7	.313	48.3	W.S.W.	105	3.5	26	0 A				
19	42.3	.280	97.3	S.S.E.	172	4.	28	7 A	4 A	11 P	.45	
20	33.7	.341	62.0	W.N.W.	226	15.5	56	2 P				
21	32.7	.226	84.3	W.N.W	57	2.	20	1 A	11 A			T.
22	18.7	.186	62.7	S.W.	64	5.5	33	12 M	1 P	12 P	.19	
23	38.0	.293	81.0	S.W.	161	5.5	33	5 P	0 A	7 A	.06	
24	24.7	.231	61.7	S.W.	80	0.5	10	2 P				
25	30.3	.286	64.0	W.	72	3.5	26	9 P				
26	32.0	.304	67.7	S.	124	3.5	26	5 P				
27	40.3	.360	74.3	S.S E.	113	2.	20	3 P	7 A		T.	
28	35.7	.312	68.0	S.S.W.	91	1.	14	8 A	8 A		T.	
29	40.0	.292	85.3	W.	49	0.	—	—	7.30 A	9 P	.25	
30	37.7	.341	73.0	N.	92	0.5	10	2 P				
31	27.7	.219	72.7	N.	321	7.5	39	9 A	4 A	11 A	.14	T.

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for the month has been unusually agreeable for this season of the year, and has pleasantly surprised those anticipating the usual March conditions. The equinoctial period passed without any of the storms which often occur at that time. The change from winter to spring while gradual has been none the less complete, and the month closed with the season some weeks in advance of ordinary conditions.

Comparisons of some of the weather elements prevailing during the month with the normal conditions for the same period show the following characteristics worthy of note. The mean atmospheric pressure has been nearly a quarter of an inch above the normal, the last week of the month especially having a very high barometer. The mean temperature has been about five degrees above the average and the mean dew point also rather high. The relative humidity has been slightly below the normal and the precipitation about one-half the usual amount. But very little snow fell. The wind movement has been slightly more than three-fourths the average amount, but few gales occurring, and those were of no great severity. The percentage of sunshine has been a little above the average.

Most of the show disappeared rather early in the month and the frost left the ground soon after.

The roads in most places are already dry and the spring repairs have begun. Some ploughing has already been done on the higher ground and all but unusually wet places will be in condition for working shortly, unless April weather should prove especially stormy.

J. E OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 112. APRIL, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.04, 27th, 8A.
Minimum reduced to freezing, 29.18, 15th, 4P.
Reduced† maximum reading, 30.34, 27th, 8A.
Reduced† min. reading, ... 29.48, 15th, 4P.
Mean reduced†, ... 29.927
Monthly range, ...86

**Air Temperature.* In Degrees Fahr.

Highest, ... 71, 17th, 3 P.
Lowest, ... 17.0, 6th, 6 A.‡
Mean, ... 43.0
Mean of means of max. and min., ... 42.4
Mean sensible (wet bulb), ... 39.9
Monthly Range, ... 54.0
Highest mean daily, ... 58.4, 17th
Lowest mean daily, ... 25.7, 3d
Mean maximum, ... 51.9
Mean minimum, ... 33.0
Mean daily range, ... 18.9
Greatest daily range, ... 38.5, 9th
Least daily range, ... 2.5, 5th

Humidity.

Mean dew point, ... 34.2
Mean force of vapor, ...303
Mean relative humidity, ... 72.1

Wind.

Prevailing Direction, North North West.

Summary.

North, ... 10 per cent.
West, ... 13 " "
North West, ... 20 " "
North North East, ... 20 " "
Other directions, ... 37 " "

Total movement, ... 5477 m.
Greatest daily movement, . . . 380 m., 28th
Least daily movement, ... 81 m., 10th
Mean daily movement, ... 182.6 m.
Mean hourly velocity, ... 7.6 m.
Maximum pressure per square foot, 10.0 lbs = 45 m. per hour, 1 P., 28th, N.E.

Precipitation. In inches.

Total precipitation, ... 3.73
Number of days on which .01 inch or more rain or melted snow fell, ... 14
Snow total in inches, ... 1

Weather.

Mean cloudiness observed, . . 68.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 234 hours or 58.0 per cent.
Number of clear days, ... 3
Number of fair days, ... 14
Number of cloudy days, ... 13

Bright Sunshine.

Number of Hours recorded, 168 hours or 42%
Rain, 2d, 5th, 6th, 10th, 14th, 15th, 16th, 17th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, 28th, 29th.
Snow, ... 2d, 5th, 6th.
Hail, ... 19th, 28th.
Thunder, ... 11th.
Gales, of 35 or more miles per hour, 38m., 1st, N.W.; 37m., 7th, N.W.; 35m., 12th, N.N.E.; 43m., 13th, N.N.E.; 35m., 17th, W.; 35m., 18th, N.W.; 43m., 21st, W.N.W.; 41m., 22d, W.N.W.; 45m., 28th, N.E.; 38m., 30th, N.W.
Last Frost, ... 27th

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

‡ Other dates also.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.10	29.97	30.007	44.	3 P	28.	12 P	36.	36.0	31.2	11
2	30.10	29.87	29.965	41.5	12 M	21.	6 A	31.2	30.7	29.5	4
3	30.08	29.90	29.987	32.	4 P	19.5	6 A	25.7	25.7	23.2	6
4	30.11	30.00	30.065	45.	2 P	17.	5 A	31.	30.8	30.0	9
5	30.11	29.88	29.975	28.	2 P	25.5	12 P	26.7	26.5	27.8	0
6	30.07	29.88	29.967	40.	3 P	17.	6 A	28.5	29.9	27.0	10
7	29.99	29.86	29.919	47.5	3 P	24.	3 A	35.7	35.7	32.3	10
8	30.15	29.94	30.003	59.	4 P	28.5	1 A	43.7	44.2	38.7	11.
9	30.23	30.07	30.145	63.	4 P	24.5	6 A	43.7	45.9	39.2	11.
10	30.13	30.03	30.085	49.	4 P	29.5	6 A	39.3	42.4	41.3	3
11	30.17	30.09	30.155	59.5	11 A	40.	12 P	49.7	49.6	46.0	4
12	30.15	29.98	30.036	67.	1 P	33.5	3 A	50.2	52.4	45.0	6
13	29.98	29.68	29.805	66.5	5 P	38.5	6 A	52.5	53.3	45.5	6
14	29.70	29.54	29.600	53.	2 P	39.	5 A	46.0	46.2	45.3	2
15	29.57	29.48	29.547	45.	9 P	40.	6 A	42.5	42.7	42.5	0
16	29.69	29.54	29.585	64.	3 P	39.5	5 A	51.7	48.7	46.3	6
17	29.83	29.69	29.765	71.	3 P	39.	6 A	55.0	58.4	52.5	10
18	30.22	29.82	30.013	59.	4 P	40.	12 P	49.5	52.7	43.8	9
19	30.28	29.96	30.168	45.5	12 M	27.	5 A	36.2	38.3	35.3	4
20	29.96	29.71	29.761	54.	4 P	34.	5 A	44.0	41.6	41.8	7
21	29.96	29.67	29.768	53.	3 P	34.	5 A	43.5	43.7	41.7	6
22	30.07	29.96	30.019	58.	4 P	38.	5 A	48.0	50.7	45.3	7
23	29.96	29.85	29.883	60.	2 P	46.	6 A	53.	52.0	52.3	2
24	29.93	29.63	29.707	48.	2 P	44.	5 A	46.	46.4	46.3	0
25	30.03	29.71	29.906	49.	2 P	40.	12 P	44.5	44.5	43.8	2
26	30.31	30.02	30.178	50.	6 P	37.	6 A	43.5	42.5	39.7	4
27	30.34	30.22	30.271	52.5	1 P	32.	5 A	42.2	43.0	39.0	9
28	30.21	29.81	29.966	43.	12 M	35.	6 A	39.	38.6	36.3	3
29	29.81	29 64	29.689	45.5	5 P	37.5	4 A	41.5	41.7	41.7	0
30	29.98	29.71	29.884	67.	3 P	40.5	6 A	53.7	55.0	48.0	6

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	17.7	.220	51.0	N.W.	233	7.	38	1 P				
2	24.7	.180	76.3	W.	110	2.5	22	12 M	1.30 P	6 P	.08	T.
3	14.0	.145	59.3	W.N.W.	217	5.5	33	11 A				
4	21.7	.205	66.7	W.S.W.	141	4.	28	4 P	5 P	12 P	**	**
5	27.7	.152	100.	N.	237	5.	32	5 P	0 A	10 P	.19	1.0
6	19.7	.173	64.7	N.W.	210	1.5	17	0 A	8 P		T.	T.
7	24.0	.225	60.0	N.W.	187	7.	37	2 P				
8	26.3	.322	47.3	N.N.W.	203	5.5	33	2 P				
9	29.7	.333	56.0	S.	96	2.5	22	4 P				
10	39.7	.274	90.0	N.W.	81	1.	14	8 A	8 A	3 P	.05	
11	43.0	.349	82.0	E.	101	1.5	17	1 P				
12	34.3	.424	52.3	N.N.E.	214	6.	35	8 A				
13	34.3	.445	47.3	N.N.E.	268	9.	43	10 A				
14	42.3	.340	80.0	E.	140	2.5	22	11 A	9 A	12 P	T.	
15	41.3	.282	92.0	N.N.E.	226	4.	28	4 P	0 A	12 P	.28	
16	43.0	.366	78.3	N.	85	2.	20	3 P	0 A	12 M	.14	
17	45.7	.535	60.0	W.	141	6.	35	1 P	10.30 P	11 P	.02	
18	32.3	.384	50.7	N.W.	251	6.	35	11 A				
19	32.3	.220	85.3	S.	92	3.	25	12 M	12 M	12 P	.38	
20	40.3	.248	90.3	N.N.W.	92	2.	20	5 P	0 A	8 P	.01	
21	36.3	.275	72.0	W.	228	9.	43	4 P	11 A	9 P	T.	
22	37.0	.394	69.0	W.	210	8.5	41	3 P	10.30 P	12 P	T.	
23	52.0	.428	88.7	S.E.	125	1.5	17	0 A	0 A	12 P	.26	
24	45.7	.320	96.0	N.	173	3.0	25	1 P	0 A	12 P	1.31	
25	40.0	.315	79.7	N.N.E.	152	3.0	25	10 P	0 A	12 P	.08	
26	36.3	.275	80.0	N.E.	185	2.0	20	11 A	0 A	2 P	.01	
27	32.0	.290	65.7	N E.	240	4.0	28	12 M				
28	31.7	.240	75.0	N.N.E.	380	10.0	45	1 P	1 P	12 P	.55	
29	40.0	.275	90.7	N.N.E.	241	4.0	28	8 A	0 A	10 P	.37	
30	40.0	.459	57.7	N.W.	218	7.	38	10 A				

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for April has been disagreeable and disappointing in many respects, and the promise of an early spring given by the March conditions has not been fully realized. Although the season is still fully up to if not slightly ahead of normal conditions the progress during the month has been noticeably small. The month opened with a week of rather cold weather and a slight snowfall soon appeared. Toward the latter part of the month the wind movement was large, the sky overcast most of the time and showers numerous.

The monthly record shows a low atmospheric pressure with a small range of barometer. The mean temperature was about 3° below the normal and the mean daily range unusually small. The precipitation was about an inch above the average for this month. While the total wind movement was above the average no gales of especial severity were noted. The amount of sunshine was abnormally small.

Frost was observed on the morning of the 27th, but no especial damage has been reported. Grass has shown considerable growth during the month. Owing to the unfavorable weather the planting of spring crops has not progressed very satisfactorily.

J. E OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 113. MAY, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.03, 22d, 7A.
Minimum reduced to freezing, 29.28, 7th, 5P.
Reduced† maximum reading, 30.33, 22d, 7A.
Reduced† min. reading, ... 29.57, 7th, 5P.
Mean reduced†, ... 29.937
Monthly range, ...75

Air Temperature. In Degrees Fahr.

Highest, ... 78.5, 20th, 12 M
Lowest, ... 32.5, 10th, 5A
Mean, ... 55.6
Mean of means of max. and min., ... 55.3
Mean sensible (wet bulb), ... 52.2
Monthly Range, ... 46.0
Highest mean daily, ... 70.2, 20th
Lowest mean daily, ... 44.8, 4th
Mean maximum, ... 64.7
Mean minimum, ... 45.9
Mean daily range, ... 18.8
Greatest daily range, ... 36.5, 7th, 10th
Least daily range, ... 5.0, 3d

Humidity.

Mean dew point, ... 48.8
Mean force of vapor, ...470
Mean relative humidity, ... 78.4

Wind.

Prevailing Direction, South South West.

Summary.

North, ... 13 per cent.
South, ... 29 " "
North East, ... 10 " "
North North East, ... 10 " "
Other directions, ... 38 " "

Total movement, ... 4769 m.
Greatest daily movement, . . . 390 m., 8th
Least daily movement, ... 37 m., 15th
Mean daily movement, ... 153.8 m.
Mean hourly velocity, ... 6.4 m.
Maximum pressure per square foot, 18.0 lbs = 60 m. per hour, 10 A., 8th, N.E.

Precipitation. In inches.

Total precipitation, ... 5.61
Number of days on which .01 inch or more rain or melted snow fell, ... 14

Weather.

Mean cloudiness observed, . . 65.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 255 hours or 56.0 per cent.
Number of clear days, ... 7
Number of fair days, ... 11
Number of cloudy days, ... 13

Bright Sunshine.

Number of Hours recorded, 200 hours or 44%

Rain, 2d, 3d, 4th, 5th, 11th, 12th, 15th, 16th, 19th, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 31th.

Snow, ... ~~2d, 5th, 6th.~~

Hail, ... ~~19th, 28th.~~

Thunder and lightning, ... 12th, 19th.

Gales, of 35 or more miles per hour, 40m., 1st N. N. E.; 60m., 8th, N. E.; 37m., 11th, S.; 47m., 12th, S.; 35m., 17th, W.

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* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.& MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.02	29.94	29.990	68.	3 P	48.	1 A	58.0	57.5	48.0	11
2	30.05	29.99	30.022	56.	4 P	44.5	6 A	50.2	50.8	47.0	6
3	30.11	30.04	30.092	48.	3 P	43.	12 P	45.5	45.3	44.3	1
4	30.10	30.02	30.087	48.	3 P	39.5	6 A	43.7	44.8	44.0	0
5	30.02	29.76	29.880	64.	3 P	42.	5 A	53.0	52.8	50.8	7
6	29.83	29.74	29.784	62.	3 P	39.	5 A	50.5	51.2	46.2	9
7	29.76	29.57	29.659	72.	5 P	35.5	5 A	53.7	54.0	47.5	9
8	92.84	29.63	29.778	54.	12 M	39.	12 P	46.5	49.8	40.2	3
9	30.00	29.84	29.932	64.5	4 P	35.5	6 A	50.0	51.2	45.5	13
10	30.08	29.94	30.018	69.	3 P	32.5	5 A	50.7	52.3	47.3	12
11	30.04	29.96	30.014	60.	12 M	42.5	5 A	51.3	51.1	50.3	5
12	30.01	29.79	29.917	70.5	3 P	49.	5 A	59.7	57.1	57.2	7
13	29.98	29.89	29.947	68.5	3 P	42.	5 A	55.3	56.7	51.5	13
14	30.05	29.95	29.994	67.	4 P	40.5	5 A	53.7	55.4	50.5	9
15	30.10	30.04	30.088	59.	1 P	40.	4 A	49.5	50.7	52.0	3
16	30.04	29.85	29.937	57.	12 M	49.	4 A	53.0	52.0	51.7	0
17	29.93	29.80	29.859	63.5	11 A	45.	5 A	54.2	53.9	48.8	8
18	30.06	29.93	30.004	72.	5 P	39.	5 A	55.5	58.7	52.8	12
19	30.00	29.76	29.836	78.	4 P	53.	5 A	65.5	64.1	63.2	10
20	30.09	29.77	29.902	78.5	12 M	61.	12 P	69.7	70.2	64.2	11
21	30.32	30.09	30.264	77.	4 P	53.	12 P	65.0	64.4	56.7	12
22	30.33	30.21	30.276	71.5	3 P	45.	5 A	58.2	59.2	53.2	13
23	30.23	29.99	30.113	60.	11 A	48.	3 A	54.0	53.0	53.0	0
24	29.99	29.86	29.902	60.5	2 P	52.5	1 A	56.5	55.9	56.3	0
25	29.96	29.87	29.909	58.	1 P	52.	12 P	55.0	54.9	55.2	0
26	30.00	29.85	29.917	58.5	3 P	50.	3 A	54.2	53.1	52.0	0
27	29.85	29.69	29.722	61.	3 P	52.	6 A	56.5	56.2	55.5	0
28	29.79	29.72	29.782	67.	5 P	54.	4 A	60.5	59.8	59.0	1
29	29.84	29 76	29.805	68.	2 P	56.5	5 A	62.2	61.9	59.5	2
30	29.81	29.70	29.743	70.	1 P	52.	12 P	61 0	62.0	56.3	12
31	29.95	29.81	29.878	76.	3 P	48.	5 A	62.0	63.4	58.3	11

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	TOTAL IN INCHES. SNOW.
1	50.3	.492	69.3	N.	280	8.	40	8 A				
2	43.0	.372	69.3	S.	55	1.	14	9 P	6 A		T.	
3	43.0	.304	91.3	E.S.E.	81	0.	—	—	2 A	12 P	.35	
4	41.3	.309	84.7	S.	45	0.	—	—	0 A	7 P	.11	
5	48.3	.427	86.0	S.S.W.	125	2.5	23	6 P	6 P	12 P	.54	
6	40.0	.386	69.3	N.	244	4.5	30	10 A				
7	40.0	.454	58.0	N.	89	3.	25	3 P				
8	29.0	.332	50.0	N.E.	390	18.	60	10 A				
9	37.3	.407	60.3	S.	227	5.5	33	12 M				
10	40.3	.447	61.3	S.	196	5.	32	5 P				
11	48 3	.390	88.3	S.	270	7.	37	11 A	12 M	6 P	.11	
12	55.3	.529	87.7	S.W.	236	11.	47	4 P	5 P	12 P	.93	
13	47.3	.478	74.0	W.	73	2.5	23	1 P				
14	45.7	.457	72.3	N.	97	2.5	23	3 P				
15	50.7	.409	91.7	N.E.	37	0.5	10	2 P	11 A	12 P	.36	
16	51.0	.393	97.0	N.E.	60	0.	—	—	0 A	12 P	.18	
17	44.7	.412	76.0	N.W.	144	6.	35	3 P				
18	47.3	.526	66.0	W.	92	1.	14	11 A				
19	61.3	.647	87.0	S.	261	5.	32	3 P	8 A	9 P	.09	
20	60.0	.767	68.3	W.S.W.	183	5.	32	9 A				
21	51.3	.620	64.0	S.E.	136	2.5	23	6 P				
22	47.7	.530	66.7	S.	139	4.	29	3 P				
23	52.0	.413	95.7	S.	164	1.5	17	5 P	7 A	12 P	.34	
24	56.0	.468	95.3	S.	218	3.5	27	12 M	0 A	12 P	.49	
25	54.7	.441	97.0	S.E.	65	0.5	10	5 P	0 A	12 P	1.24	
26	50.7	.413	90.0	N.N.E.	144	1.5	17	6 P	0 A	12 P	.38	
27	54.3	.468	90.7	N.N.E.	202	2.5	23	10 A	0 A	2 P	.33	
28	58.0	.522	93.7	W.	74	1.5	17	10 A	2 A	1 P	.16	
29	57.7	.547	93.3	S.S.W.	99	1.	14	3 P	6 P		T.	
30	52.0	.570	70.7	W.N.W.	163	3.5	27	3 P				
31	53.0	.640	65.7	N.N.E.	180	5.5	33	1 P	7 P		T.	

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The conditions prevailing during the month have been most disappointing and the weather as a whole has been extremely disagreeable. An excess of rain and a temperature below the normal combined, have made a very unsatisfactory record compared with that of previous years.

The records show that the barometric pressure was about normal and the range rather small. The temperature was nearly three degrees below the normal, with the lowest maximum for the month in our records here.

The rainfall was about 40 per cent. above the normal, and the relative humidity unusually high. From the 23d to the 29th inclusive rain fell every day. The sky was overcast nearly the whole period, but three hours of sunshine being recorded during that period.

The season which was fully two weeks ahead of normal conditions at the beginning of April is now nearly a like amount backward. Most crops have made only a slow progress during the month, although grass is looking unusually well. Fair and warmer weather is much needed during June for satisfactory progress with most crops.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 114. JUNE, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.05, 16th, 7A.
Minimum reduced to freezing, 29.42, 25th, 5P.
Reduced† maximum reading, 30.35, 16th, 7A.
Reduced† min. reading, ... 29.40, 25th, 5P.
Mean reduced†, ... 29.947
Monthly range, ...95

**Air Temperature.* In Degrees Fahr.

Highest, ... 89.5, 25th, 3 P.
Lowest, ... 39.5, 16th, 5A.
Mean, ... 66.0
Mean of means of max. and min., ... 66.1
Mean sensible (wet bulb), ... 62.5
Monthly Range, ... 50.0
Highest mean daily, ... 76.1, 25th
Lowest mean daily, ... 55.2, 22d
Mean maximum, ... 77.3
Mean minimum, ... 55.0
Mean daily range, ... 22.3
Greatest daily range, ... 31.0, 17th
Least daily range, ... 8.0, 4th, 19th

Humidity.

Mean dew point, ... 59.3
Mean force of vapor, ...700
Mean relative humidity, ... 77.1

Wind.

Prevailing Direction, West South West.

Summary.

North West, ... 13 per cent.
South, ... 20 " "
West, ... 10 " "
South West, ... 10 " "
South South West, ... 10 " "
North East, ... 10 " "
North North East, ... 10 " "
Other directions, ... 17 " "
Total movement, ... 4162 m.
Greatest daily movement, . . . 314 m., 4th
Least daily movement, ... 33 m., 16th
Mean daily movement, ... 138.7 m.
Mean hourly velocity, ... 5.8 m.
Maximum pressure per square foot, 8.5 lbs = 41 m. per hour, 1 P., 15th.

Precipitation. In inches.

Total precipitation, ... 3.69
Number of days on which .01 inch or more rain or melted snow fell, ... 13

Weather.

Mean cloudiness observed, . . 57.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 187 hours or 41.0 per cent.
Number of clear days, ... 5
Number of fair days, ... 18
Number of cloudy days, ... 7

Bright Sunshine.

Number of Hours recorded, 270 hours or 59%

Rain. 2d, 3d, 4th, 6th, 8th, 11th, 12th, 13th, 14th, 18th, 19th, 20th, 21st, 22d, 25th, 28th.

Thunder and lightning, 6th, 8th, 12th, 13th, 14th, 22d, 25th.

Gales, of 35 or more miles per hour, 37m., 4th, N.E.; 41m., 15th, N.N.E.; 40m., 18th, S.W.; 40m., 26th, S.W.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.00	29.92	29.961	75.	3 P	50.	5 A	62.5	64.0	59.5	10
2	30.02	29.94	29.975	65.5	5 P	50.	5 A	57.8	57.4	55.3	5
3	30.12	29.97	30.058	69.	1 P	52.	1 A	60.5	60.3	58.0	2
4	30.26	30.13	30.222	62.	3 P	54.	12 P	58.0	58.2	54.5	5
5	30.25	30.10	30.152	78.	5 P	50.	5 A	64.0	63.2	59.2	14
6	30.14	29.96	30.074	81.	2 P	52.	5 A	66.5	64.5	61.5	11
7	30.16	30.04	30.094	86.	4 P	56.5	5 A	71.3	69.7	65.3	14
8	30.09	29.81	29.910	85.5	3 P	58.	6 A	71.7	71.0	66.7	14
9	29.92	29.78	29.828	83.	3 P	62.	4 A	72.5	72.3	67.2	14
10	30.12	29.92	30.074	76.5	3 P	56.5	4 A	66.5	66.0	61.7	12
11	30.16	29.90	30.016	72.5	5 P	56.	4 A	64.2	63.2	61.3	5
12	29.95	29.82	29.860	85.	1 P	62.5	4 A	73.7	71.7	70.	5
13	29.91	29.84	29.899	83.	12 M	64.	4 A	73.5	71.7	69.7	7
14	29.89	29.71	29.785	82.5	4 P	64.	5 A	73.2	70.8	67.7	9
15	30.31	29.82	30.142	67.	10 A	45.	12 P	56.	62.7	57.2	10
16	30.35	30.15	30.237	70.	4 P	39.5	5 A	54.7	57.1	52.8	9
17	30.17	30.05	30.083	78.	3 P	47.	5 A	62.5	63.5	58.0	11
18	30.10	29.88	29.979	74.5	1 P	49.5	5 A	62.	62.6	58.5	11
19	29.88	29.63	29.688	66.	2 P	58.	12 P	62.	60.9	62.5	0
20	29.73	29.64	29.695	74.	4 P	49.	5 A	61.5	62.8	59.8	9
21	29.91	29.73	29.780	70.	2 P	54.5	5 A	62.8	59.5	56.8	7
22	30.07	29.90	29.989	71.	12 M	45.	5 A	58.0	55.2	55.5	8
23	30.12	30.00	30.060	75.	4 P	50.	5 A	62.5	62.5	58.0	12
24	30.01	29.65	29.783	83.5	3 P	55.	5 A	69.2	70.4	65.5	10
25	29.65	29.40	29.502	89.5	3 P	63.	4 A	76.2	76.1	72.3	9
26	29.88	29.51	29.669	85.	3 P	66.	12 P	75.5	75.8	67.3	12
27	30.02	29.88	30.004	86.	3 P	58.	5 A	72.0	73.0	67.3	10
28	30.04	29.88	29.957	75.5	3 P	62.	8 A	68.7	68.0	66.7	2
29	29.97	29.88	29.921	83.	3 P	62.	6 A	72.5	71.8	67.8	10
30	30.04	29.97	30.004	86.	4 P	58.	5 A	72.0	73.4	71.5	13

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	SNOW.
1	55.0	.639	71.0	N.E.	207	3.	24	12 M				
2	53.3	.483	86.7	N.E.	152	1.5	17	5 P	3 P		T.	
3	55.3	.520	81.3	N.N.E.	163	4.5	30	11 A	6 P	7 P	T.	
4	51.0	.497	76.0	N.N.E.	314	7.	37	10 A	12 M		T.	
5	55.7	.624	74.0	N.W.	149	3.	24	6 A				
6	58.3	.701	75.3	S	87	1.	14	3 P	3 P	11 P	.08	
7	62.7	.782	76.3	S.S.W.	53	0.	—	—				
8	63.3	.852	73.7	S.	152	5.	32	8 P	9 P	12 P	.32	
9	64.3	.851	74.7	W.	148	1.5	17	10 A				
10	58.7	.607	76.0	N.E.	71	1.5	17	8 A				
11	59.0	.619	82.0	S.S.E.	195	4.5	30	1 P	7 A	11 A	.16	
12	68.3	.844	83.7	S.	95	1.5	17	4 P	1 A	3 P	.14	
13	69.0	.781	90.0	S.	52	0.5	10	9 P	1 P	12 P	.84	
14	63.7	.803	79.7	S.S.W.	131	2.	20	6 P	0 A	9 A	.42	
15	50.3	.550	68.0	N.W.	232	8.5	41	1 P				
16	47.7	.518	69.0	S.W.	33	0.5	10	2 P				
17	55.0	.615	72.3	W.	37	0.5	10	12 M				
18	54.0	.597	78.3	S.	291	8.	40	2 P	7 A	12 P	.01	
19	62.3	.570	99.0	S.	207	4.5	30	5 P	0 A	9 P	1.19	
20	56.7	.638	73.7	N.W.	147	4.5	30	5 P	6 P	12 P	.04	
21	53.3	.562	75.3	W.	162	4.5	30	9 A	0 A	8 A	.11	
22	52.3	.512	80.3	N.N.E.	88	5.5	33	4 P	11 A	11 P	.10	
23	53.3	.610	71.3	N.W.	93	4.5	30	1 P				
24	61.3	.828	68.0	S.S.W.	178	4.5	30	6 P				
25	68.0	1.030	72.7	S.W.	265	5.0	32	2 P	6 P	8 P	.05	
26	62.0	.942	63.0	W.S.W.	246	8.0	40	1 P				
27	62.7	.903	67.0	S S.E.	76	0 5	10	9 P				
28	65.7	.705	91.3	N.N.W.	50	0.5	10	2 P	4 A	8 P	.23	
29	65.3	.843	83.7	N.N.W.	38	1.5	17	10 P				
30	69.3	.918	80.3	S.W.	70	2.0	20	4 P				

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather during the month has presented but few characteristics of special interest, and the departures from normal conditions have been small and unimportant.

The mean pressure has been very nearly normal and the range slightly above the average. The mean temperature was about normal; the maximum for the month the lowest for a number of years. The total wind movement was considerably above the average, although but few high winds occurred. The mean relative humidity was about 10 per cent above the normal.

Thunder showers have been quite prevalent during the month.

From the 15th to the 24th a period of rather cool weather prevailed, followed for a few days by the warmest weather of the month.

Growing crops have made good progress during the month. Haying has begun in this vicinity and is progressing favorably.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 115. JULY, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.14, 12th, 7A.
Minimum reduced to freezing, 29.35, 9th, 2P.
Reduced† maximum reading, 30.44, 12th, 7A.
Reduced† min. reading, ... 29.63, 9th, 2P.
Mean reduced†, ... 30.017
Monthly range, ...81

****Air Temperature.*** In Degrees Fahr.

Highest, ... 96.5, 3d, 3 P.
Lowest, ... 40.0, 11th, 5A.
Mean, ... 70.9
Mean of means of max. and min., ... 70.9
Mean sensible (wet bulb), ... 67.4
Monthly Range, ... 56.5
Highest mean daily, ... 81.6, 3d
Lowest mean daily, ... 56.9, 13th
Mean maximum, ... 82.5
Mean minimum, ... 59.3
Mean daily range, ... 23.2
Greatest daily range, ... 37.5, 17th
Least daily range, ... 7.0, 13th, 28th

Humidity.

Mean dew point, ... 64.6
Mean force of vapor, ...822
Mean relative humidity, ... 79.3

Wind.

Prevailing Direction, South West.

Summary.

South South West, ... 26 per cent.
South, ... 22 " "
South West, ... 13 " "
West, ... 13 " "
Other directions . . . . . 26 " "
Total movement, ... 3377 m.
Greatest daily movement, . . . 231 m., 15th
Least daily movement, ... 30 m., 11th
Mean daily movement, ... 109 m.
Mean hourly velocity, ... 4.5 m.
Maximum pressure per square foot, 17.5 lbs = 59 m. per hour, 30th. 2 P., S. W.

Precipitation. In inches.

Total precipitation, ... 4.09
Number of days on which .01 inch or more rain or melted snow fell, ... 10

Weather.

Mean cloudiness observed, . . 53.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 226 hours or 49.0 per cent.
Number of clear days, ... 6
Number of fair days, ... 11
Number of cloudy days, ... 14

Bright Sunshine.

Number of Hours recorded, 236 hours or 51%

Rain, 4th, 9th, 13th, 18th, 19th, 21st, 26th, 27th, 28th, 29th, 30th, 31st,

Thunder and lightning, 4th, 18th, 19th, 29th, 30th, 31st.

Gales, of 35 or more miles per hour, 59m., 30th, S.W.

* Temperature in ground shelter.
† Reduced to freezing and sea level.
* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.								NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.		
1	30.12	29.98	30.039	86.	3 P	64.	5 A	75.	75.7	67.2		9
2	30.21	30.10	30.159	87.	4 P	58.	5 A	72.5	74.2	68.2		13
3	30.12	29.89	29.953	96.5	3 P	64.5	4 A	80.5	81.6	74.5		13
4	29.94	29.78	29.850	92.5	2 P	69.	12 P	80.7	79.5	72.1		9
5	30.24	29.94	30.123	77.	4 P	55.	12 P	66.	67.7	60.5		15
6	30.31	30.19	30.256	80.5	4 P	45.	5 A	62.7	64.6	59.5		15
7	30.23	30.03	30.113	84.	4 P	50.5	5 A	67.3	68.9	61.7		15
8	30.03	29.73	29.830	89.	4 P	54.5	5 A	71.7	73.3	67.3		12
9	29.78	29.63	29.695	82.	3 P	57.	12 P	69.5	70.8	62.5		5
10	30.02	29.78	29.898	74.	4 P	50.	5 A	62.0	62.2	55.5		9
11	30.32	30.02	30.196	73.	4 P	40.	5 A	56.5	59.5	56.0		11
12	30.44	30.32	30.428	74.	3 P	51.	3 A	62.5	61.9	56.0		6
13	30.40	30.22	30.276	60.5	2 P	53.5	9 A	57.	56.9	56.7		0
14	30.25	29.97	30.108	86.5	4 P	50.	5 A	68.2	70.0	67.7		12
15	29.97	29.77	29.828	87.	3 P	60.	12 P	73.5	74.7	67.3		8
16	30.02	29.88	29.932	84.	4 P	52.	5 A	68.	68.7	64.7		12
17	30.08	29.98	30.031	86.5	3 P	49.	5 A	67.7	70.2	67.3		13
18	30.07	29.98	30.035	82.	3 P	62.5	5 A	72.2	72.0	70.7		3
19	30.02	29.92	29.957	80.5	2 P	68.	4 A	74.2	72.8	73.5		1
20	29.93	29.87	29.898	88.	3 P	69.5	4 A	78.7	75.9	76.0		4
21	30.04	29.92	29.962	83.	3 P	69.5	5 A	76.2	72.5	72.7		5
22	30.25	30.04	30.169	81.	3 P	67.	2 A	74.	70.9	68.3		7
23	30.27	30.16	30.210	83.	2 P	52.5	4 A	67.7	70.0	69.7		12
24	30.19	30.10	30.129	83.5	3 P	63.	5 A	73.5	71.4	70.3		8
25	30.13	29.98	30.041	76.	1 P	66.	5 A	71.	69.7	70.0		0
26	29.98	29.93	29.958	76.5	5 P	66.	12 P	71.2	70.7	70.8		0
27	29.97	29.86	29.913	84.	3 P	66.	3 A	75.0	73.6	71.8		4
28	29.91	29.84	29.877	77.	5 P	70.	3 A	73.5	72.4	72.3		0
29	29.87	29.84	29.830	89.	4 M	71.	4 A	80.0	77.2	75.3		5
30	29.89	29.86	29.863	91.	12 M	68.	12 P	79.5	74.3	70.8		5
31	30.03	29.88	29.960	84.5	3 P	68.	3 A	76.2	73.8	72.2		5

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	SNOW.
1	62.7	.906	65.7	W.	162	1.5	17	11 A				
2	64.3	.908	69.0	S.S.W.	103	3.	25	7 P				
3	70.7	1.179	68.0	S.W.	170	2.5	23	4 P				
4	67.7	1.123	65.0	W.	132	4.	28	1.30 P	8 P	10 P	.01	
5	55.7	.676	67.3	N.N.E.	167	4.	28	1.30 P				
6	54.7	.679	69.7	S.S.W.	71	1.5	17	9 P				
7	56.3	.762	64.7	S.S.W.	88	1.5	17	9 P				
8	63.0	.922	68.3	S.S.W.	127	2.	20	2 P				
9	55.7	.799	61.7	S.W.	158	4.5	30	4 P	4 A	8 A	.04	
10	47.7	.672	58.0	N.W.	73	1.5	17	4 P				
11	52.0	.565	74.0	N.W.	30	0.5	10	1 P				
12	50.3	.593	64.7	N.E.	126	1.	14	2 P				
13	55.7	.480	93.3	N.	176	2.5	23	6 P	6 A	9 P	.57	
14	64.3	.860	77.7	S.	90	1.5	17	2 P				
15	62.3	.905	65.0	W.	231	5.	32	12 M				
16	62.0	.774	75.0	N.	81	2.5	23	1 P				
17	64.3	.840	77.7	S.	52	0.5	10	9 P				
18	70.0	.829	88.7	S.	136	3.5	27	5 P	10 A	12 P	T.	
19	73.3	.861	94.7	S.	187	1.5	17	3 P	0 A	9 P	.16	
20	75.0	.993	88.7	S·S.W.	61	0.5	10	3 P				
21	72.3	.861	93.0	W.	69	1.5	17	5 P	12 M	1.30 P	.05	
22	66.3	.778	86.7	N.E.	123	1.	14	9 A				
23	68.0	.836	84.3	S.	67	1.	14	5 P				
24	69.0	.821	90.0	S.S.W.	103	1.	14	7 A				
25	70.0	.760	95.3	S.	182	2.5	23	8 P				
26	70.7	.772	97.0	S.S.W.	93	0.5	10	2.30 P	0 A	12 M	.15	
27	70.3	.892	85.3	S.W.	50	0.	—	—	6 P	11 P	T.	
28	72.3	.806	97.7	S.	63	0.	—	—	4 A	12 P	.24	
29	74.3	.957	90.7	S S.W.	70	2.	20	7 P	1.30 P	7 P	.03	
30	70.3	.778	96.0	S.W.	43	17.5	59	2 P	1 P	4 P	2.65	
31	71.0	.887	86.7	N.E.	93	0.5	10	6 P	7 P	8 P	.19	

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for July has been in most respects favorable for this season of the year although a number of departures from the normal have been noted. Some of the features which may be mentioned are the rather high mean pressure and barometric range for this time of year, the high relative humidity, mean force of vapor and dew point.

The mean temperature has been slightly above the normal, while the range is the greatest in our July records for the past ten years. The wind movement was about normal and but one gale is recorded for the month.

The month opened with warm weather and on the 3d the maximum temperature (96.5 F) was noted. This is the maximum of our July records here excepting only 1894 when 98° F was reached.

The thunder storm of the 30th was the most severe of the season, 2.65 inches rain falling in about two hours and the wind reaching a velocity of nearly sixty miles per hour. Corn and tobacco were badly blown down and damaged in some places.

Hay harvesting is practically over. The yield is reported abundant and the crop secured in good condition. Corn and tobacco have made good progress and a large yield is expected except where damaged by the storm of the 30th. Early potatoes are a light crop but the later varieties may give a better yield. The fruit crop is rather light in this section.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 116. AUGUST, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.97, 28th, 9A.
Minimum reduced to freezing, 29.38, 25th, 7P.
Reduced† maximum reading, 30.26, 28th, 9A.
Reduced† min. reading, ... 29.66, 25th, 7P.
Mean reduced†, ... 29.959
Monthly range, ...60

****Air Temperature.*** In Degrees Fahr.

Highest, ... 91.0, 24th, 1 P.
Lowest, ... 44.5, 28th, 5A.
Mean, ... 69.7
Mean of means of max. and min., ... 70.2
Mean sensible(wet bulb), ... 66.9
Monthly Range, ... 46.5
Highest mean daily, ... 75.8, 2d
Lowest mean daily, ... 60.4, 28th
Mean maximum, ... 80.6
Mean minimum, ... 59.8
Mean daily range, ... 20.8
Greatest daily range, ... 35.0, 14th
Least daily range, ... 7.5, 10th

Humidity.

Mean dew point, ... 64.6
Mean force of vapor, ...781
Mean relative humidity, ... 82.1

Wind.

Prevailing Direction, South West.

Summary.

South South West, ... 26 per cent.
South, ... 23 " "
South West, ... 13 " "
West, ... 9 " "
Other directions . . . . . 29 " "
Total movement, ... 3111 m.
Greatest daily movement, . . . 202 m., 29th
Least daily movement, ... 18 m., 14th
Mean daily movement, ... 100 m.
Mean hourly velocity, ... 4.2 m.
Maximum pressure per square foot, 13.0 lbs = 51m. per hour, 23d. 6 P., N. W.

Precipitation. In inches.

Total precipitation, ... 6.85
Number of days on which .01 inch or more rain or melted snow fell, ... 15

Weather.

Mean cloudiness observed, . . 60.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 228 hours or 53.0 per cent.
Number of clear days, ... 5
Number of fair days, ... 14
Number of cloudy days, ... 12

Bright Sunshine.

Number of Hours recorded, 201 hours or 47%

Rain, 1st, 4th, 5th, 7th, 8th, 9th, 10th, 11th, 12th, 13 th, 16th, 17th, 18th, 19th, 23d, 24th, 25th, 26th.

Thunder and lightning, 3d, 7th, 8th, 16th, 17th, 19th, 23d, 24th.

Gales, of 35 or more miles per hour, 35m., 17th, N.E.; 51m., 23d, N.W.

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* Temperature in ground shelter.

† Reduced to freeziug and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.06	29.94	30.004	74.	1 P	65.5	5 A	69.7	69.0	68.7	0
2	30.04	29.93	29.995	87.	3 P	64.	12 P	75.5	75.8	72.8	11
3	30.07	29.95	30.014	85.	4 P	57.	5 A	71.0	72.6	70.8	9
4	29.98	29.83	29.908	86.5	2 P	68.	12 P	77.2	75.6	73.7	7
5	30.00	29.86	29.935	80.	4 P	61.	12 P	70.5	69.4	67.8	7
6	30.03	29.92	29.977	82.	3 P	59.	2 A	70.5	71.3	67.5	10
7	29.96	29.84	29.896	86.	3 P	65.	5 A	75.5	75.2	70.3	7
8	29.86	29.78	29.805	87.	1 P	69.5	4 A	78.2	75.6	73.2	4
9	29.93	29.82	29.893	79.	2 P	63.	12 P	71.0	71.6	69.5	2
10	29.95	29.90	29.938	68.	2 P	60.5	5 A	64.2	63.6	63.2	0
11	30.06	29.92	30.001	71.	2 P	60.	4 A	65.5	65.4	64.3	0
12	30.08	29.99	30.026	77.	4 P	62.5	5 A	69.7	68.7	66.0	3
13	30.19	29.98	30.068	79.	2 P	55.	12 P	67.0	67.8	63.8	3
14	30.24	30.17	30.200	82.5	4 P	47.5	5 A	65.0	65.1	60.2	10
15	30.24	30.13	30.184	81.	3 P	58.	5 A	69.5	68.7	63.5	12
16	30.15	29.96	30.031	82.5	3 P	58.	5 A	70.2	69.8	67.0	6
17	29.99	29.81	29.896	85.5	3 P	64.	4 A	74.7	70.7	69.2	5
18	29.97	29.92	29.943	81.5	12 M	62.	5 A	71.7	71.3	70.2	6
19	29.98	29.84	29.903	69.5	0 A	59.	12 P	64.3	65.0	64.3	1
20	30.06	29.98	30.005	79.	4 P	51.5	6 A	65.2	64.4	58.8	11
21	29.98	29.86	29.908	84.	3 P	50.5	5 A	67.2	68.2	64.7	13
22	29.89	29.79	29.827	84.5	1 P	59.	6 A	71.7	73.2	69.5	10
23	29.89	29.74	29.837	86.	3 P	66.	8 P	76.0	73.4	71.8	5
24	29.90	29.76	29.805	91.	1 P	67.	12 P	79.0	74.7	73.5	8
25	29.82	29.66	29.707	85.5	3 P	66.5	5 A	76.0	73.6	70.3	4
26	29.87	29.72	29.807	75.	3 P	61.	5 A	68.0	67.4	61.7	8
27	30.17	29.87	30.025	73.5	3 P	50.	12 P	61.7	62.7	57.3	10
28	30.26	30.17	30.222	74.	4 P	44.5	5 A	59.2	60.4	56.8	13
29	30.20	29.96	30.056	71.	3 P	52.	5 A	61.5	64.1	63.0	0
30	29.96	29.88	29.924	84.	3 P	65.	5 A	74.5	73.5	68.7	12
31	30.03	29.96	29.991	88.	2 P	62.	5 A	75.0	72.9	70.5	4

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE OF VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	68.3	.724	95.0	N.W.	25	1.5	17	10 P	6 A	11 P	.15	
2	71.3	.932	85.7	N.N.W.	77	0.5	10	10 A				
3	71.0	.858	85.3	S.S.W.	58	2.	20	7 P				
4	73.0	.908	91.3	S.W.	185	5.5	33	4 P	1 A	12 P	.55	
5	66.0	.760	88.0	W.N.W.	121	4.	28	2 P	0 A	11.30 A	1.13	
6	65.0	.797	79.7	W.	128	2.	20	4 P				
7	67.3	.944	73.7	S.S.W.	127	2.	20	12 M	9 P	10 P	.27	
8	71.3	.953	83.7	S	94	0.5	10	2 P	2 A	12 P	.07	
9	67.3	.819	83.7	S.W.	67	1.5	17	2 P	0 A	5 A	.10	
10	62.3	.611	92.3	N.N.E.	29	0.	—	—	7 A	12 P	.66	
11	62.3	.663	87.7	N.E.	150	2.5	23	1 P	0 A	7 A	.33	
12	63.7	.733	82.3	S.	92	2.5	23	5 P	10 P	12 P	T.	
13	61.3	.722	78.3	S.W.	79	1.5	17	2 P	0 A	8 A	.24	
14	56.0	.694	71.3	W.	18	0.	—	—				
15	60.0	.753	73.0	S.W.	64	0.5	10	7 P				
16	65.7	.763	85.7	S.	189	4.	28	7 P	7.30 P	9 P	.49	
17	64.7	.869	78.3	S.	167	6.	35	4 P	9 A	5 P	.58	
18	69.3	.809	89.0	S.	63	0.5	10	12 M	9 P	12 P	T.	
19	63.7	.622	96.0	N.	106	4.	28	2 P	0 A	4 P	.86	
20	55.7	.605	78.7	N.N.W.	40	0.	—	—				
21	61.3	.769	76.7	S.S.W.	59	1.5	17	1 A				
22	66.7	.886	77.0	S.	101	2.	20	12 M				
23	70.7	.866	88.7	S.	129	13.	51	6 P	6 P	12 P	.24	
24	71.7	.974	84.7	S.S.W.	173	5.	32	6 P	0 A	9 P	1.16	
25	68.7	.896	80.0	S.S.W.	93	1.	14	9 P	1 P	1.30 P	T.	
26	57.3	.690	70.7	W.	157	3.5	26	3 P	10 P	12 P	.02	
27	53.0	.603	69.7	N.W.	79	3.5	26	1 P				
28	53.0	.580	72.3	S.S.W.	34	0.5	10	9 P				
29	61.3	.640	86.3	S.S.W.	202	4.5	30	12 M				
30	65.3	.853	79.7	W.S.W.	164	2.5	23	2 P				
31	68.0	911.	81.7	S.S.W.	41	0.5	10	4 P				

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for August was especially characterized by the large precipitation and high relative humidity. The precipitation was nearly twice the normal amount, and the greatest in our August records; the humidity was about 10 per cent. above the normal.

Some of the other characteristics for the month were the rather low mean barometer and small range, the small wind movement and the large number of thunder storms. The mean temperature was 1.4 degrees above the average.

The month opened with rain on the 1st, followed by nearly a week of warm and mostly fair weather. From the 7th to the 14th rain was observed every day, the sun shone but little and sultry weather prevailed. On the 23d and 24th severe thunder showers occurred at about 6 P. M. The shower of the 23d especially was accompanied by an unusual display of lightning. The barometric fluctuations during both showers were very noticeable. A few days of fine cool weather occurred near the end of the month but the last day was marked by high temperature and humidity.

The month has been generally favorable for growing crops. Tobacco is being harvested in fine condition. Corn has made good progress during the month and a good yield is reported. Fruit is not plentiful, excepting grapes. The yield of apples will be small but of good quality. Celery and other garden crops have suffered some from the excessive rain.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 117. SEPTEMBER, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.11, 13th, 7A.
Minimum reduced to freezing, 29.31, 23d, 5P.
Reduced† maximum reading, 30.41, 13th, 7A.
Reduced† min. reading, ... 29.59, 23d, 5P.
Mean reduced†, ... 30.012
Monthly range, ...82

****Air Temperature.*** In Degrees Fahr.

Highest, ... 93.0, 3d, 3P.
Lowest, ... 34.5, 21st, 6A.
Mean, ... 63.0
Mean of means of max. and min., ... 63.6
Mean sensible (wet bulb), ... 59.8
Monthly Range, ... 58.5
Highest mean daily, ... 78.5, 3d
Lowest mean daily, ... 49.9, 25th
Mean maximum, ... 76.2
Mean minimum, ... 51.1
Mean daily range, ... 25.1
Greatest daily range, ... 36.5, 28th
Least daily range, ... 10., 25th

Humidity.

Mean dew point, ... 56.9
Mean force of vapor, ...646
Mean relative humidity, ... 80.0

Wind.

Prevailing Direction, South West.

Summary.

South South West, ... 17 per cent.
South, ... 17 " "
South West, ... 23 " "
West, ... 17 per cent.
Other directions . . . . . 26 " "
Total movement, ... 2787 m.
Greatest daily movement, . . . 220 m., 22d
Least daily movement, ... 27 m., 9th
Mean daily movement, ... 92.9m.
Mean hourly velocity, ... 3.9 m.
Maximum pressure per square foot, 30.5 lbs = 78m. per hour, 7th. 1 30 P., S. W.

Precipitation. In inches.

Total precipitation, ... 3.65
Number of days on which .01 inch or more rain or melted snow fell, ... 7

Weather.

Mean cloudiness observed, . . 48.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 154 hours or 42.0 per cent.
Number of clear days, ... 9
Number of fair days, ... 14
Number of cloudy days, ... 7

Bright Sunshine.

Number of Hours recorded, 218 hours or 58%

Rain, 1st, 2d, 4th, 7th, 16th, 18th, 22d, 23d, 24th.
Thunder and lightning, 1st, 2d, 4th, 6th, 7th, 18th, 23d.
Hail, 7th.
Aurora, 9th.
Frosts on lowlands, 21st, 28th.
Gales, of 35 or more miles per hour, 48m., 2d, N.W.; 78m., 7th, S.W.; 35m., 20th, W. N.W.; 44m., 27th, N.W.

* Temperature in ground shelter.
† Reduced to freezing and sea level.
* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.06	29.95	30.009	90.5	2 P	67.	5 A	78.7	76.8	74.5	10
2	30.02	29.81	29.902	90.	3 P	62.5	5 A	76.2	74.8	72.2	6
3	29.84	29.77	29.793	93.	3 P	67.5	3 A	80.2	78.5	75.0	11
4	29.87	29.73	29.811	90.5	3 P	67.5	5 A	79.0	77.2	74.5	8
5	29.86	29.80	29.833	88.	3 P	68.	6 A	78.0	76.1	71.7	8
6	29.92	29.82	29.865	86.	3 P	65.	4 A	75.5	76.4	71.5	10
7	29.94	29.65	29.775	85.	11 A	58.	12 P	71.5	69.2	67.3	6
8	30.22	29.94	30.150	74.	3 P	52.	12 P	63.0	61.2	55.0	6
9	30.33	30.22	30.297	80.	3 P	44.5	6 A	62.2	61.5	58.0	10
10	30.32	30.24	30.287	75.	1 P	48.	5 A	61.5	58.5	54.2	4
11	30.32	30.11	30.192	70.	1 P	40.5	6 A	55.2	56.3	49.8	12
12	30.37	30.17	30.296	68.5	1 P	42.5	4 A	55.5	55.2	49.0	12
13	30.41	30.27	30.335	71.5	4 P	37.	6 A	54.2	55.2	52.2	12
14	30.29	30.15	30.207	71.	3 P	39.5	6 A	55.2	55.1	52.2	5
15	30.17	30.04	30.085	71.	2 P	53.5	6 A	62.2	63.5	62.5	2
16	30.04	29.91	29.935	74.	3 P	61.	6 A	67.5	66.9	65.7	1
17	30.00	29.93	29.966	81.5	1 P	58.	12 P	69.7	69.7	65.8	6
18	29.98	29.70	29.786	83.	2 P	52.5	6 A	67.7	64.5	65.7	5
19	29.94	29.74	29.826	73.	1 P	53.	12 P	63.0	64.0	56.5	12
20	30.20	29.94	30.073	66.5	3 P	44.	6 A	55.2	55.3	50.0	10
21	30.37	30.20	30.325	65.5	3 P	34.5	6 A	50.0	50.8	46.7	12
22	30.30	29.96	30.142	71.	3 P	42.5	5 A	56.7	58.1	56.2	9
23	29.96	29.59	29.666	78.	3 P	58.5	5 A	68.2	66.5	68.2	2
24	30.13	29.61	29.917	67.	1 A	46.	12 P	56.5	54.5	51.8	0
25	30.15	29.98	30.065	54.	2 P	44.	6 A	49.	49.9	49.7	0
26	29.98	29.60	29.799	71.5	1 P	52.	1 A	61.7	59.8	57.7	4
27	29.94	29.59	29.794	66.	1 P	45.	12 P	55.5	57.5	51.0	8
28	30.09	29.94	30.021	73.5	3 P	37.	6 A	55.5	56.0	52.3	10
29	30.16	30.07	30.116	76.	4 P	42.5	6 A	59.2	58.7	56.8	9
30	30.22	30.08	30.155	80.5	3 P	49.	5 A	64 7	62.2	60.5	8

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	72.3	1.025	82.	W.	77	4.	28	7 P	5 P	6 P	.29	
2	71.0	.927	87.	S.S.E.	45	11.5	48	7 P	7 P	8 P	.09	
3	72.7	1.072	78.3	S.W.	108	1.	14	12 M				
4	73.0	.982	83.	S.S W.	108	3.	24	1 P	7 P	10 P	.12	
5	69.7	.954	80.	S.S.W.	39	0.	—	—				
6	70.0	.949	79.3	S	72	1.	14	12 P				
7	66.3	.744	87.	W.S.W.	112	30.5	78	1.30 P	12 M	7 P	1.67	
8	50.7	.546	73.7	S.W.	39	1.5	17	3 P				
9	54.3	.639	75.3	S.W.	27	0.5	10	10 P				
10	51.0	.498	81.	N.	118	5.	32	1 P				
11	43.0	.493	62.7	N.W.	103	2.5	22	3 P				
12	41.3	.461	67.3	N.N.E.	120	4.5	30	7.30 A				
13	49.3	.500	79.	S.	61	1.	14	2 P				
14	50.3	.506	81.7	S.S.W.	56	0.	—	—				
15	60.0	.608	88.7	S.	32	0.	—	—				
16	64.3	.685	89.7	E.S.E.	48	0.	—	—	6 A	4 P	T.	
17	64.3	.731	85.	S.W.	67	1.5	17	2 P				
18	64.0	.765	86.7	S.W.	73	3.	24	11 A	2 P	3.30 P	.06	
19	50.7	.613	61.3	W.	174	4.5	30	11 A				
20	44.7	.456	69.	W.	135	6.	35	4 P				
21	42.3	.396	75.7	S.W.	73	1.5	17	3 P				
22	53.3	.530	80.7	S.S.E.	220	3.5	27	2 P	11 P	12 P	T.	
23	67.7	.734	93.3	S.	125	3.5	27	2 P	0 A	2 P	.86	
24	49.7	.430	85.3	N.E.	194	3.5	27	8 A	7 A	12 M	.56	
25	48.3	.380	89.7	W.	31	0.5	10	10 P				
26	55.0	.560	81.0	S.S.W.	81	2.	20	12 M				
27	46 3	.472	70.7	W.	214	9.5	14	2 P				
28	48.7	.500	78.7	S.W.	78	2.5	22	12 M				
29	54.7	.569	83.3	S.S.W.	62	2.	20	4 P				
30	58.3	.647	83.3	S.	95	1.	14	4 P				

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for September presented considerable variation in its features, which taken altogether give a mean condition for the month that may be called favorable. Some unpleasant periods however were noted.

The month opened with a week of unusually hot and sultry weather. This hot period culminated on the 7th in a thunderstorm which was the most severe of the year. Shortly after noon the thunder and lightning was very severe, the wind attained a velocity of nearly 80 miles per hour and a number of trees were blown down. Nearly an inch of rain fell in twenty minutes, together with some little hail. The damage reported was comparatively little for such a severe storm. Two other showers of less severity followed on the same day. The next week gradually grew cooler; the change from the preceding week being particularly marked. The latter part of the month was fair September weather. Two light frosts occurred but not much damage was done.

Most of the weather elements for the month were about normal excepting the total wind movement which was less than 80 per cent. of the usual amount.

The weather was generally favorable for maturing crops. The second cutting of hay was secured in good condition. Corn is harvested and a good yield reported. Potatoes are a light crop in this section.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51ft. Above sea level, 273.5 ft. **

BULLETIN No. 118. OCTOBER, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.17, 4th, 7A.
Minimum reduced to freezing, 29.08, 22d, 4P.
Reduced† maximum reading, 30.46, 4th, 7A.
Reduced† min. reading, ... 29.37, 22d, 4P.
Mean reduced†, ... 30.089
Monthly range, ... 1.09

****Air Temperature.*** In Degrees Fahr.

Highest, ... 86.5, 1st, 3P.
Lowest, ... 27, 18th, 5A., 28th, 6A.
Mean, ... 51.1
Mean of means of max. and min., ... 51.1
Mean sensible(wet bulb), ... 49.4
Monthly Range, ... 59.5
Highest mean daily, ... 72.6, 4th
Lowest mean daily, ... 36.8, 30th
Mean maximum, ... 60.9
Mean minimum, ... 41.3
Mean daily range, ... 19.6
Greatest daily range, ... 33.0, 1st
Least daily range, ... 7., 15th

Humidity.

Mean dew point, ... 46.6
Mean force of vapor, ...422
Mean relative humidity, ... 83.6

Wind.

Prevailing Direction, West.

Summary.

North West, ... 23 per cent.
West, ... 16 " "
North, ... 10 " "
West South West, ... 10 per cent.
South West, ... 10 " "
South South West, ... 10 " "
Other directions . . . . . 21 " "
Total movement, ... 3999 m.
Greatest daily movement, . . . 288 m., 27th
Least daily movement, ... 37 m., 2d
Mean daily movement, ... 129 m.
Mean hourly velocity, ... 5.4 m.
Maximum pressure per square foot, 12.0 lbs = 49m. per hour, 23d, 1P., W.

Precipitation. In inches.

Total precipitation, ... 6.27
Number of days on which .01 inch or more rain or melted snow fell, ... 11

Weather.

Mean cloudiness observed, . . 62.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 185 hours or 54.0 per cent.
Number of clear days, ... 10
Number of fair days, ... 5
Number of cloudy days, ... 16

Bright Sunshine.

Number of Hours recorded, 157 hours or 46%

Rain, 4th, 5th, 7th, 8th, 12th, 14th, 15th, 19th, 21st, 22d, 23d, 26th, 27th, 29th, 30th.

Frosts, 7th, 10th, 13th, 17th, 18th, 28th, 29th.

Gales, of 35 or more miles per hour, 35m., 6th, N.N.E.; 35m., 9th, N.W.; 38m., 11th, S.W.; 35m., 15th, S.W.; 49m., 23d, W.; 44m., 26th, S.; 46m., 27th, N.W.

Thunder and Lightning, 4th.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.39	30.22	30.313	86.5	3 P	53.5	5 A	70.0	66.8	64.3	10
2	30.42	30.34	30.373	78.	4 P	56.	6 A	67.0	65.7	63.5	7
3	30.34	30.15	30.228	77.	3 P	57.	5 A	67.0	66.2	65.2	10
4	30.15	30.04	30.085	83.	1 P	64.5	4 A	73.7	72.6	71.8	4
5	30.08	29.80	29.894	70.	0 A	53.	12 P	61.5	59.0	59.2	0
6	30.39	29.84	30.243	62.5	3 P	38.	12 P	50.2	54.8	48.8	11
7	30.46	30.24	30.360	64.	3 P	32.5	6 A	48.3	49.6	48.0	9
8	30.25	29.96	30.039	60.	2 P	51.	12 P	55.5	54.9	53.8	0
9	30.28	30.03	30.111	66.	12 M	39.5	6 A	52.7	54.0	49.5	9
10	30.44	30.27	30.362	59.	4 P	30.	6 A	44.5	46.7	42.7	11
11	30.27	29.73	29.952	69.	2 P	47.5	3 A	58.3	59.5	59.0	3
12	29.87	29.69	29.750	66.	12 M	48.	12 P	57.0	57.5	53.5	5
13	30.05	29.87	29.982	61.5	4 P	37.	6 A	49.2	47.1	43.2	11
14	30.08	29.68	29.948	54.	12 M	35.	5 A	44.5	45.8	45.5	2
15	29.83	29.66	29.717	50.	2 P	43.	12 P	46.5	46.2	44.8	0
16	30.20	29.83	30.077	52.	2 P	34.	12 P	43.0	44.4	40.3	6
17	30.34	30.20	30.276	52.	3 P	30.5	5 A	41.2	40.7	38.7	11
18	30.40	30.29	30.330	46.	2 P	27.	5 A	36.5	38.5	36.8	4
19	30.31	30.03	30.128	51.	4 P	40.	3 A	45.5	42.7	46.2	0
20	30.26	30.07	30.176	64.	3 P	42.	6 A	53.0	50.5	47.0	11
21	30.26	29.91	30.145	51.	2 P	36.5	2 A	43.7	46.9	47.5	0
22	29.91	29.37	29.475	67.	2 P	49.5	0 A	58.3	56.4	57.3	0
23	30.22	29.52	29.906	55.	3 P	43.	6 A	49.0	49.5	45.5	3
24	30.35	30.22	30.314	63.	1 P	37.	6 A	50.0	50.1	46.7	9
25	30.32	30.16	30.237	64.	3 P	39.5	5 A	51.7	52.2	52.0	6
26	30.16	29 50	29.739	65.	9 P	54.5	1 A	59.7	61.1	61.8	0
27	30.24	29.57	30.024	60.	0 A	35.	12 P	47.5	44.9	39.8	3
28	30.43	30.24	30.325	52.	4 P	27.	6 A	39.5	39.0	37.3	10
29	30.44	30.21	30.336	43.5	2 P	28.	4 A	35.8	36.8	38.0	0
30	30.21	29.85	29.932	46.	2 P	35.	12 P	40.5	41.5	42.8	0
31	30.14	29.82	29.995	49.	1 P	35.	4 A	42.0	41.6	41.7	2

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	TOTAL IN INCHES. SNOW.
1	62.3	.751	83.7	S.	43	0.	—	—				
2	61.7	.669	85.7	S.W.	37	0.5	10	12 M				
3	64.0	.690	89.	S.S.W.	130	3.5	26	2 P				
4	71.3	.855	92.3	S.S.W.	90	0.5	10	12 M	9 P	12 P	T.	
5	58.7	.515	98.3	W.	72	1.	14	10 A	0 A	6 P	1.95	
6	44.0	.435	70.3	N.N.E.	185	6.	35	9 A				
7	45.0	.414	79.3	S.S.W.	69	1.5	17	1 P	9 P	12 P	T.	
8	52.3	.438	91.7	S.W.	109	1.5	17	4 A	0 A	5 P	.65	
9	44.3	.448	68.	W.	135	6.	35	12 M				
10	38.0	.334	74.3	W.	66	1.	14	7 P				
11	56.7	.572	84.3	S.W.	239	7.	38	9 P				
12	50.0	.465	78.3	N.W.	200	4.	28	7 P	1 A	12 M	.09	
13	39.0	.339	76.7	N.W.	66	2.5	22	9 A				
14	43.7	.364	89.	E.	124	2.	20	9 P	6 P	12 P	.58	
15	41.0	.317	82.3	N.W.	194	6.	35	3 P	0 A	2 P	.17	
16	35.7	.297	71.7	N.W.	259	5.	32	9 A				
17	34.0	.275	74.3	N.	129	5.5	33	11 A				
18	33.3	.244	81.7	E.S.E.	110	2.	20	12 M				
19	44.0	.330	90.0	N.E.	148	3.5	27	3 P	9 A	12 M	.60	
20	43.3	.391	80.3	N.	87	2.	20	4 P				
21	46.3	.344	92.0	E.S.E.	69	0.5	10	2 P	9 P	12 P	.36	
22	56.3	.500	93.3	W.	108	5.5	33	4 P	0 A	4 P	.61	
23	41.7	.351	77.3	W.S.W.	198	12.	49	1 P	8.30 A		T.	
24	43.0	.380	78.3	W.S.W.	150	5.	32	7 P				
25	50.0	.445	85.0	W.S.W.	168	4.5	30	1 P				
26	60.7	.572	95.3	S.	280	9.5	44	9 P	9-30 A	12 P	1.00	
27	35.0	.279	75.0	N.W.	288	10.5	46	4 P	0 A	3 A	.15	
28	32.3	.265	75.7	N.W.	63	2.	20	9 A				
29	36.3	.239	91.7	N.	60	0.5	10	2 P	3 P	12 P	T.	
30	42.0	.283	96.3	W.	43	0.5	10	7 A	0 A	4 P	.11	
31	39 7	.281	88.7	N.W.	80	2.5	22	6 P				

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for the month has been characteristic of the season, although some departures from normal conditions were noted.

The large precipitation was the most noteworthy feature, the amount being about one and two-thirds the October average rainfall. The rains were quite generally distributed throughout the month. The relative humidity was also unusually high. The mean barometric pressure was nearly normal with about the usual range.

The mean temperature was over a degree above the average owing to several very warm days at the beginning of the month.

Notwithstanding the large amount of rain the amount of sunshine was about up to average conditions. The wind movement was about normal, and although the number of gales was large there were none of any marked severity.

The first heavy frost of the season occurred on the 7th, followed by several others at intervals of a few days.

The apple crop has been generally harvested and the yield is reported as light. Much of the autumn foliage has fallen during the month and many of the trees are already denuded.

Most of the farm work of the season has progressed favorably.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 119. NOVEMBER, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.22, 4th, 7A.
Minimum reduced to freezing, 28.97, 30th, 7A.
Reduced† maximum reading, 30.53, 4th, 7A.
Reduced† min. reading, ... 29.28, 30th, 7A.
Mean reduced†, ... 30.010
Monthly range, ... 1.25

****Air Temperature.*** In Degrees Fahr.

Highest, ... 62.0, 3d, 3P.
Lowest, ... 6, 29th, 8A.
Mean, ... 37.3
Mean of means of max. and min., ... 37.5
Mean sensible (wet bulb), ... 36.3
Monthly Range, ... 56.0
Highest mean daily, ... 5.02, 6th
Lowest mean daily, ... 18.1, 29th
Mean maximum, ... 46.2
Mean minimum, ... 28.9
Mean daily range, ... 17.4
Greatest daily range, ... 36.0, 4th
Least daily range, ... 4.0, 19th

Humidity.

Mean dew point, ... 32.7
Mean force of vapor, ...247
Mean relative humidity, ... 83.4

Wind.

Prevailing Direction, North North West.

Summary.

North West, ... 17 per cent.
West, ... 13 " "
North, ... 27 " "
Other directions . . . . . 43 per cent.
Total movement, ... 4856 m.
Greatest daily movement, . . . 675 m., 27th
Least daily movement, ... 21 m., 22d
Mean daily movement, ... 162 m.
Mean hourly velocity, ... 6.7 m.
Maximum pressure per square foot, 19.0 lbs = 62m. per hour, 27th, 7A., N.

Precipitation. In inches.

Total precipitation, ... 5.48
Number of days on which .01 inch or more rain or melted snow fell, ... 11

Weather.

Mean cloudiness observed, . . 60.0 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 189 hours or 60.0 per cent.
Number of clear days, ... 7
Number of fair days, ... 10
Number of cloudy days, ... 13

Bright Sunshine.

Number of Hours recorded, 126 hours or 40%

Rain, 6th, 9th, 10th, 11th, 13th, 14th, 17th, 18th, 19th, 24th, 30th.

Sleet, 24th.

Snow, 24th, 26th, 27th, 30th.

Gales, of 35 or more miles per hour, 36m., 6th, N.W.; 36m., 7th, W.; 35m., 8th, S.; 55m., 11th, W.; 40m., 20th, N.W.; 35m., 24th, N.; 51m., 26th, N.; 62m., 27th, N.; 40m., 28th, N.

No. days sleighing, ... 4
Snow on ground at end of month, . 6 inches.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAFER.	MEAN SENSIBLE. WET BULB.	
1	30.31	30.13	30.279	53.	3 P	30.	6 A	41.5	41.5	39.8	8
2	30.33	30.07	30.194	61.	1 P	38.	0 A	49.5	47.9	46.8	5
3	30.49	30.33	30.456	62.	3 P	29.	6 A	45.5	44.0	41.7	10
4	30.53	30.36	30.439	61.	3 P	25.	6 A	43.0	42.6	40.0	9
5	30.36	29.81	30.129	56.	4 P	40.	6 A	48.0	49.1	48.8	1
6	29.81	29.56	29.630	56.	4 A	40.	12 P	48.0	50.2	46.0	1
7	30.28	29.72	30.089	44.	2 P	32.	11 P	38.0	38.8	35.2	6
8	30.32	30.23	30.234	60.	3 P	28.5	6 A	44.2	44.2	43.7	8
9	30.35	30.23	30.281	60.	2 P	34.	6 A	47.0	46.2	44.3	8
10	30.27	29.61	29.955	44.	3 P	36.	12 P	40.0	37.9	37.0	0
11	30.18	29.54	29.851	43.	8 A	32.5	12 P	37.7	37.4	35.3	2
12	30.32	30.18	30.285	50.	3 P	24.	6 A	37.0	36.1	32.2	10
13	30.29	29.90	30.110	47.	3 P	23.	6 A	35.0	37.6	36.3	5
14	29.95	29.75	29.820	45.	3 P	37.	12 P	41.0	40.5	37.7	0
15	30.21	29.95	30.166	43.5	2 P	28.	5 A	35.8	36.3	33.3	6
16	30.32	30.21	30.264	51.	2 P	30.	12 P	40.5	38.7	37.0	9
17	30.25	30.06	30.169	41.	12 P	30.	0 A	35.5	35.3	36.8	0
18	30.06	29.70	29.892	47.	2 P	40.	0 A	43.5	43.7	43.7	0
19	29.70	29.29	29.375	45.	12 P	41.	5 A	43.0	42.2	42.0	0
20	30.02	29.41	29.814	49.	1 P	38.	12 P	43.5	44.1	39.7	4
21	30.27	30.02	30.208	53.	2 P	29.5	12 P	41.2	38.6	35.7	9
22	30.29	30.08	30.182	41.	3 P	24.5	6 A	32.7	31.9	32.0	4
23	30.09	30.02	30.062	48.	3 P	30.	5 A	39.0	37.7	38.5	2
24	30.12	29.90	29.999	37.	1 A	27.	12 P	32.0	32.7	32.0	0
25	30.20	29.90	30.069	32.	3 P	20.	12 P	26.0	26.7	25.8	6
26	30.19	29.62	30.005	25.	3 P	13.	3 A	19.0	20.3	30.9	3
27	29.74	29.47	29.590	26.	12 P	19.5	2 A	22.7	22.2	23.2	0
28	29.80	29.71	29.787	36.	2 P	21.	12 P	28.5	28.3	26.2	8
29	29.75	29.38	29.583	33.	3 P	6.	8 A	19.5	18.1	18.7	4
30	29.54	29.28	29.383	36.5	3 P	21.	0 A	28.7	29.5	28.5	0

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	36.0	.279	77.7	W.	81	1.	14	12 P				
2	44.3	.355	85.3	S.S.W.	243	4.5	30	8 A				
3	38.0	.326	77.3	S.S.W.	56	0.5	10	2 P				
4	35.3	.316	76.0	S.W.	60	1.	14	9 P				
5	47.3	.373	91.0	S.	138	4.	28	1 P				
6	42.0	.399	85.3	W.	193	6.5	36	7 A	5 A	12 P	.13	
7	30.7	.232	75.0	W.	189	6.5	36	8 A				
8	41.3	.330	83.7	S.	198	6.	35	12 M				
9	41.0	.352	79.7	N.E.	61	1.	14	12 P	9 P	12 P	T.	
10	36.7	.222	97.3	N.	167	2.5	22	10 P	0 A	12 P	2.08	
11	30.7	.231	75.7	N.W.	289	15.	55	9 A	0 A	2 A	T.	
12	26.0	.220	68.3	N.W.	78	3.	24	0 A				
13	33.0	.246	82.3	S.S.W.	97	3.	24	7 P	9 P	12 P	.09	
14	34.7	.244	84.0	N.E.	114	2.	20	6 P	0 A	7 A	.02	
15	28.0	.218	73.7	W.	100	2.5	22	3 P				
16	32.0	.254	75.3	S.	96	1.5	17	2 P				
17	36.0	.222	97.0	N.	86	1.	14	9 P	8.30 A	12 P	.17	
18	42.0	.294	91.3	E.S.E.	96	1.	14	6 A	0 A	12 P	.40	
19	41.0	.275	93.3	N.	122	3.	24	11 P	0 A	11 P	1.32	
20	34.0	.285	70.3	N.W.	351	8.	40	10 A				
21	30.7	.257	74.0	N.W.	130	4.	28	10 A				
22	30.0	.192	91.3	E.S.E.	21	0.5	10	9 P				
23	36.7	.250	89.7	N.	45	1.5	17	8 P				
24	30.3	.187	92.3	N.	295	6.	35	1 P	7 A	12 P	.55	2
25	23.3	.147	88.7	N.W.	222	5.5	33	7 A				
26	20.7	.115	99.0	N.E.	65	13.0	51	12 P	6 P	12 P	**	**
27	20.7	.130	89.3	N.	675	19.5	62	7 A	0 A	7 P	.65	6.
28	19.7	.162	71.3	N.	332	8.0	40	1 A				
29	14.3	.118	82.0	N.N.W.	29	0.5	10	8 P				
30	25.0	.167	84.7	N.	179	5.0	32	2 P	7 A	4 P	.07	T.

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

REMARKS.

The weather for the month marked the change from autumn to winter with more than usual emphasis, although the mean conditions show no remarkable departures from the monthly normals.

A comparison with the records of previous years shows a precipitation of about 30 per cent. above the average and a rather large wind movement. The mean temperature was nearly a degree below the normal November mean.

The first few days of the month were generally fair and mild and might fairly be said to have given us a remnant of Indian Summer. On the 10th an unusually heavy fall of rain occurred. The latter part of the month was more unpleasant than the first, and the last few days especially so.

The first snowfall of the season occurred on the 24th.

On the evening of the 26th a storm that had been predicted for earlier in the week appeared and by the morning of the 27th had reached its height. This proved to be the most severe storm that has occurred here at this season for many years and has been exceeded in severity by but few even in the mid-winter season. The snowfall while not especially heavy was accompanied by such heavy gales that the drifting was most unusual and resulted in blocking traffic for a considerable time.

The total wind movement on the 27th was 675 miles which is the maximum record at this station for a period of 24 hours. The maximum velocity of 62 miles per hour, attained at about 7 A. M., has however been exceeded here a number of times.

The month closed with good sleighing and every prospect that winter has fairly set in.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 120. DECEMBER, 1898.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.19, 16th, 7A.
Minimum reduced to freezing,	28.82, 5th, 1A.
Reduced† maximum reading,	30.52, 16th, 7A.
Reduced† min. reading,	29.13, 5th, 1A.
Mean reduced†,	29.963
Monthly range,	1.39

**Air Temperature.* In Degrees Fahr.

Highest,	48.0, 30th, 3P.
Lowest,	—12.0, 14th, 6A.
Mean,	26.2
Mean of means of max. and min.,	25.8
Mean sensible (wet bulb),	25.1
Monthly Range,	60.0
Highest mean daily,	38.3, 23d
Lowest mean daily,	7.8, 14th
Mean maximum,	34.8
Mean minimum,	17.1
Mean daily range,	17.7
Greatest daily range,	30.5, 16th
Least daily range,	4.5, 11th

Humidity.

Mean dew point,	20.8
Mean force of vapor,	.156
Mean relative humidity,	80.2

Wind.

Prevailing Direction, West.

Summary.

West,	17 per cent
South West,	13 " "
South,	13 " "
South South West	10 " "
North West	10 " "
North	10 " "
Other directions	25 per cent.
Total movement,	4830 m.
Greatest daily movement,	427 m., 5th
Least daily movement,	5 m., 16d
Mean daily movement,	156 m.
Mean hourly velocity,	6.5 m.

Maximum pressure per square foot, 28lbs = 75m. per hour, 4th, 12A., E.S.E.

Precipitation. In inches.

Total precipitation,	2.30
Number of days on which .01 inch or more rain or melted snow fell,	9
Snow total in inches	11
Snow on ground at end of month	3 inches

Weather.

Mean cloudiness observed,	66.0 per cent.
Total cloudiness recorded by the Sun Thermometer,	170 hours or 60.0 per cent.
Number of clear days,	5
Number of fair days,	12
Number of cloudy days,	14

Bright Sunshine.

Number of Hours recorded, 113 hours or 40%

Rain, 4th, 5th, 19th, 20th, 21st, 22d, 23d, 31st, 24th,

Sleet, 4th, 22d.

Snow, 5th, 8th, 19th, 20th, 27th, 29th, 31th.

Gales, of 35 or more miles per hour, 41m., 1st, W.N. W. ; 75m, 4th, E.S E.; 73m, 5th, E. S.E. ; 47th, 6th, N.W.' ; 40m, 8th, N.W.; 43m, 10th., W. ; 40m, 11th. W. ; 36m, 23d., N.W. ; 45m. 28th., N. W.; 50m, 31st., N.N.E.

No. days sleighing, 14

* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	29.93	29.54	29.788	37.5	12 M	28.5	6 P	33.0	34.4	31.5	4
2	30.25	29.93	30.124	39.	1 P	20.	12 P	29.5	29.2	26.3	5
3	30.31	30.24	30.267	33.	2 P	10.	7 A	21.5	23.5	23.8	0
4	30.25	29.18	30.013	41.	12 P	27.5	5 A	34.2	35.8	34.2	0
5	29.67	29.13	29.329	42.	4 A	33.5	11 P	37.8	37.9	35.7	0
6	29.90	29.67	29.865	35.5	1 P	27.	6 P	31.2	33.2	31.5	3
7	30.00	29.83	29.909	36.	1 P	24.5	12 P	30.2	28.5	26.0	5
8	30.18	30.00	30.124	29.5	3 P	18.	7 A	23.7	24.3	22.6	5
9	30.32	30.10	30.225	27.5	2 P	16.	8 A	21.7	22.6	20.4	7
10	30.10	29.60	29.775	29.5	1 P	23.5	0 A	26.5	27.9	26.3	0
11	29.60	29.40	29.454	30.	9 P	25.5	8 A	27.8	28.5	26.8	1
12	29.71	29.49	29.634	30.	2 A	16.	12 P	23.0	22.1	20.5	0
13	30.23	29.60	29.950	16.	2 A	-1.	8 P	7.5	9.5	7.8	8
14	30.41	30.23	30.381	18.	2 P	-12.	6 A	3.	7.8	7.8	9
15	30.51	30.38	30.489	31.	3 P	8.	12 P	19.5	16.8	15.4	8
16	30.52	30.38	30.447	30.5	3 P	0.	8 A	15.2	11.8	12.0	8
17	30.38	29.94	30.113	34.	4 P	8.	3 A	21.	24.5	27.7	5
18	30.00	29.88	29.931	40.	1 A	17.	8 A	28.5	31.8	30.0	4
19	30.31	30.00	30.281	35.	1 A	16.	12 P	25.5	23.2	20.5	6
20	30.27	29.90	30.005	33.	9 P	15.	1 A	24.	25.3	27.7	0
21	29.99	29.89	29.936	34.	2 P	28.	4 A	31.	31.3	32.5	0
22	30.09	29.69	29.957	35.	2 P	30.	10 A	32.5	32.9	33.3	0
23	30.08	29.61	29.843	45.5	12 M	32.	5 A	38.7	38.3	34.5	5
24	30.17	30 06	30.117	43.	2 P	26.9	7 A	34.5	34.0	30.5	4
25	30.28	30.12	30.233	39.	12 M	19.5	8 A	29.2	29.8	25.2	5
26	30.27	29.92	30.109	35.	3 P	10.5	8 A	22.7	20.6	18.1	7
27	29.92	29.49	29.598	38.	3 P	8.5	4 A	23.2	27.4	28.3	1
28	30.05	29.49	29.875	33.	0 A	3.	9 P	18.0	13.6	9.1	9
29	30.06	29.92	29.988	37.	4 P	10.	4 A	23.5	24.7	25.3	3
30	29.97	29.85	29.920	48.	3 P	29.	4 A	38.5	31.2	40.2	1
31	30.31	29.95	30.184	42.	0 A	12.	12 P	27.0	28.5	26.0	0

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	24.3	.207	64.0	W.	223	8.5	41	3 P				
2	22.7	.159	80.3	S.	106	1.5	17	1 A				
3	22.0	.144	90.0	N.N.E.	25	1.	14	6 A				
4	31.0	.209	86.0	N.N.E.	219	28.	75	12 P	5 P	12 P	.23	
5	33.0	.225	85.3	S.W.	427	27.	73	1 A	0 A	3 P	.22	T.
6	27.3	.194	78.0	W.S.W.	308	11.	47	7 A				
7	22.0	.154	80.0	S.W.	192	3.5	26	11 A				
8	18.3	.132	79.0	W.S.W.	220	8.	40	7 P				
9	13.7	.126	69.3	W.	260	3.5	26	3 P				
10	17.3	.151	68.3	W.	312	9.	43	9 A				
11	22.3	.159	78.3	W.	298	8.	40	1 P	8 A	12 P	.35	5.
12	19.0	.114	92.7	N.N.W.	63	1.5	17	0 A				
13	2.3	.069	76.3	N.W.	160	4.	28	1 P				
14	3.0	.076	78.0	S.W.	94	0.5	10	2 P				
15	10.0	.104	76.7	S.W.	81	1.	14	1 A				
16	8.3	.088	85.3	N.W.	5	0.	—	–				
17	25.3	.157	88.0	S.E.	13	0.5	10	2 P				
18	26.0	.191	78.0	W.	77	3.5	26	2 P				
19	11.7	.125	64.3	N.N.W.	174	5.5	33	7 A	10.30 P	12 P	**	**
20	27.0	.154	98.3	N.	73	0.	—	—	0 A	12 P	**	3.
21	32.0	.184	98.3	E.N.E.	10	0.	—	—	0 A	12 P	.60	
22	32.7	.191	98.3	S.S.W.	39	0.5	10	2 A	0 A	12 P	.45	
23	28.7	.232	70.7	N.W.	121	6.5	36	1 P	0 A	8 A	.15	
24	25.7	.187	75.3	S.	159	2.	20	1 P				
25	16.3	.159	61.0	N.	60	1.	14	3 P				
26	12.7	.115	74.3	S.	7	0.	—	—				
27	25.0	.169	83.3	S.S.W.	151	2.5	23	9 A	7 A	10 A	T	T
28	4.7	.073	79.3	W.	248	10.	45	1 P				
29	21.0	.160	77.0	S.S.W.	185	4.5	30	10 P	5 A	7 A	T	T
30	36.0	.283	77.0	S.	277	3.5	26	1 P				
31	25.0	.154	95.3	N.	243	12.5	50	4 P	6 A	12 P	.30	3.

* Rain or melted snow at base of tower. T=trace. ** Included in following day.

Annual Summary for 1898.

Pressure. In inches.

Maximum reduced to freezing, ... 30.45 Mar. 26th, 7 A
Minimum reduced to freezing, ... 28.69 Feb. 19th, 6 A
Maximum reduced to freezing and sea-level, ... 30.76 Mar. 26th. 7 A
Minimum reduced to freezing and sea-level, ... 29.01 Feb. 16th, 6 A
Mean reduced to freezing and sea-level, ... 30.008
*Annual range, ... 1.75

Air Temperature. In degrees Fahr.

Highest, ... 96.5 July 3d 3 P
Lowest, ... —19.0 Feb. 3rd 6 A
Mean, ... 47.5
Mean of means of max. and min., . . . 47.5
Mean sensible (wet bulb), ... 45.2
Annual range, ... 115.5
Highest mean daily, ... 81.6 July 3rd
Lowest mean daily, ... —2.0 Jan. 30th
Mean maximum, ... 57.7
Mean minimum, ... 37.4
Mean daily range, ... 20.3
Greatest daily range, ... 40.0 Feb. 3d
Least daily range, ... 2.5 April 5th

Humidity.

Mean dew point, ... 4.16
Mean force of vapor, ...426
Mean relative humidity, ... 79.8

Wind.

Prevailing Direction, West, or S. 86° W.

Summary.

South, ... 15 per cent.
West, ... 13 " "
North West, ... 12 " "
South South West, ... 11 " "
South West . . . . . 10 " "
North . . . . . 9 " "
Other Directions, ... 30 " "
Total movement, ... 48,425 m.
Greatest daily movement, . . 675m.,Nov. 27
Least daily movement, ... 4m. Jan. 18
Mean daily movement, ... 133 m.
Mean hourly velocity, ... 5.5
Maximum pressure per square foot 30.5 lbs. 78m. per hour on Sept 7th, 1.30P S.W.

Precipitation. In inches.

Total precipitation, rain or melted snow 53.89
Number of days on which .01 or more rain or melted snow fell, ... 135
Snow total in inches, ... 69.5

Weather.

Mean cloudiness observed, ... 60%
Total cloudiness recorded by Sun Thermometer, ... 2317 hours=52.4%
Number of clear days, ... 78
Number of fair days, ... 138
Number of cloudy days, ... 149

Bright Sunshine.

Number of hours recorded, 2159 hours= 48%

Dates of Frosts.

Last, ... April 27th
First, ... Sept. 21st

Dates of Snow.

Last, ... April 6th
First, ... Nov. 24th
Total days of sleighing, ... 85

Gales of 50 or More Miles Per Hour.

Jan. 3d, 67m. N,W.; 24th, 56m. N.W.;
March 20th, 56m. W.
May 8th, 60m. N. E.
July. 30th, 59m, S.W.
Aug. 23d, 51m. N.W.
Sept. 7th, 78m. S.W.
Nov. 11th, 55m. W. 27th, 62m. N.
Dec. 4th, 75m. W., 5th, 73m. E.S.E., 31st, 50m. N.N.E.

* Temperature in ground shelter.

J. E. OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of barometer above ground, 51ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 121. JANUARY, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.57, 2d, 9A.
Minimum reduced to freezing,	28.91, 25th, 3A.
Reduced† maximum reading,	30.92, 2d, 9A.
Reduced† min. reading,	29.22, 25th, 3A.
Mean tri-daily reduced†,	30.113
Monthly range,	1.70

****Air Temperature.*** In Degrees Fahr.

Highest,	49.0, 5th, 11A.
Lowest,	—21.5, 2d, 6A.
Mean hourly,	23.3
Mean of means of max. and min.,	22.9
Mean sensible (wet bulb),	21.6
Monthly Range,	70.5
Highest mean daily,	43.1, 5th
Lowest mean daily,	0.8, 2d
Mean maximum,	32.6
Mean minimum,	13.3
Mean daily range,	19.3
Greatest daily range,	37.0, 20th
Least daily range,	8.5, 6th

Humidity.

Mean dew point,	16.6
Mean force of vapor,	.141
Mean relative humidity,	77.7

Precipitation. In inches.

Total precipitation,	2.80
Number of days on which .01 inch or more rain or melted snow fell,	8
Snow total in inches	2
Snow on ground at end of mouth	Trace

Wind.

Total movement,	4926 m.
Greatest daily movement,	392 m., 1st
Least daily movement,	11 m., 12th
Mean daily movement,	159 m.
Mean hourly velocity,	6.6 m.
Maximum pressure per square foot, 20lbs = 64m. per hour, 27th, 12M., N.W.	

Prevailing Direction, West North West.

Summary.

North,	16 per cent
South,	16 " "
West,	26 " "
North West.	19 " "
Other directions	23 per cent.

Weather.

Mean cloudiness observed,	53.0 per cent.
Total cloudiness recorded by the Sun Thermometer,	143 hours or 49.0 per cent.
Number of clear days,	9
Number of fair days,	9
Number of cloudy days,	13

Bright Sunshine.

Number of Hours recorded, 151 hours or 51%

Rain, 6th, 13th, 14th, 16th, 17th, 24th, 25th.

Sleet, 6th, 13th, 24th.

Snow, 1st,6th, 9th, 13th, 14th, 25th.

Thunder and Lightning, 24th.

Corona, 26th.

No. days sleighing, ... 13

Gales, of 35 or more miles per hour, 44m., 1st, N.; 52m., 7th, N.W.; 35m., 11th, N N.E.; 41m., 14th, N.W.; 60m.,15th, N.W.; 42m.,25th, N.W. ; 64m., 27th, N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.& MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.74	30.20	30.493	12.	0 A	-10.	12 P	1.0	4.4	4.4	5
2	30.92	30.64	30.809	15.	9 P	-21.5	6 A	-3.2	0.8	1.5	5
3	30.64	30.39	30.474	29.	3 P	10.	2 A	19.5	21.2	21.4	8
4	30.39	29.93	30.118	43.	12 P	20.	2 A	31.5	34.8	35.7	2
5	30.28	29.87	30.069	49.	11 A	34.	12 P	41.5	43.1	38.5	0
6	30.31	29.60	29.974	34.	0 A	25.5	9 A	29.8	29.4	28.5	0
7	30.22	29.58	30.028	32.	5 A	19.	12 P	25.5	24.8	21.5	7
8	30.45	30.19	30.318	30.	12 P	12.5	6 A	21.2	22.3	20.5	9
9	30.29	30.16	30.199	33.5	2 P	21.	12 P	27.3	28.8	26.8	0
10	30.60	30.29	30.516	21.	0 A	-1.	12 P	10.0	6.3	2.9	8
11	30.65	30.55	30.615	21.	3 P	-6.5	6 A	7.2	8.4	7.9	9
12	30.61	30.48	30.536	27.	4 P	-2.	8 A	12.5	12.3	10.5	9
13	30.53	30.20	30.386	25.	12 P	12.	8 A	18.5	18.9	19.8	0
14	30.20	29.42	29.732	44.	12 P	25.	0 A	34.5	31.0	31.5	0
15	30.10	29.46	29.924	44.	1 A	33.	12 P	38.5	39.5	34.2	1
16	30.15	29.73	30.022	39.5	3 P	23.	7½ A	31.2	32.2	31.0	0
17	29.95	29.65	29.787	45.	2 P	31.	8 A	38.0	36.4	34.7	6
18	30.30	29.96	30.144	35.	1 A	15.	12 P	25.0	26.4	21.5	9.5
19	30.38	30.30	30.326	32.	4 P	6.	7½ A	19.0	17.4	14.8	9.5
20	30.31	30.11	30.197	39.	3 P	2.	7½ A	20.5	20.9	30.1	9.5
21	30.11	29.66	29.868	41.	3 P	20.	7 A	30.5	32.0	27.7	3
22	29.95	29.65	29.767	39.	3 P	27.5	8 A	33.2	33.7	29.8	6
23	30.13	29.95	30.078	42.	3 P	30.	7 A	36.0	34.1	30.7	7
24	30.04	29.24	29.653	37.5	5 P	25.	6 A	31.2	31.3	31.8	0
25	30.02	29.22	29.750	33.	0 A	21.	12 P	27.0	27.4	23.7	7
26	30.03	29.42	29.754	42.	4 P	15·	9 A	28.5	29.2	30.3	4
27	30.12	29.42	29.886	36.	1 A	5.	12 P	20.5	18.5	13.4	9.5
28	30.16	29.76	29.987	20.	2 P	3.5	6 A	11.7	13.5	14.1	2
29	30.08	29.76	29.998	21.5	1 P	7.0	12 P	14.2	15.0	13.9	6
30	30.10	29.72	30.034	26.5	4 P	0.5	6½ A	13.5	14.0	13.5	6
31	30.16	29.97	30.065	20.	4 P	9.	1 A	14.5	15.7	13.2	3

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.				PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR. TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	SNOW.
1	0.7	.058	92.3	N.	392	9.5	44 5 A	0 A	8 A	.10	1
2	-9.7	.064	63.3	S.	88	2.	20 8 P				
3	16.0	.130	73.0	S.	264	2.5	22 6 A				
4	33.7	.222	91.3	S.	198	4.	28 12 P				
5	29.3	.287	60.3	W.	314	4.5	30 1 A				
6	26.3	.162	91.0	N.	152	1.	14 7 A	6 A	12 P	.96	1
7	15.0	.130	70.7	W.	201	13.5	52 10 A				
8	16.3	.124	77.7	S.S.W.	171	5.5	33 3 P				
9	23.3	.157	83.0	W.	149	2.5	22 0 A	12 M	5 A	T	T.
10	-3.7	.055	72.3	N.N.W.	151	0.	— —				
11	1.3	.075	71.3	N.W.	127	6.	35 5 P				
12	5.0	.085	74.7	N.	11	0.5	10 10 P				
13	18.7	.112	94.3	N.N.W.	14	0.	— —	2 P	12 P	**	**
14	30.0	.181	95.3	N.	36	8.5	41 11 P	0 A	7 P	.58	T.
15	27.3	.230	66.0	W.	353	18.	60 0 A				
16	28.0	.184	87.3	W.	58	0.5	10 3 P	8 P	12 P	.30	
17	29.7	.224	78.3	N.W.	97	3.5	27 7 P	0 A	4 P	.18	
18	15.3	.133	69.7	N.N.W.	231	3.	25 2 P				
19	9.3	.101	75.0	N.W.	90	4.	28 1 A				
20	14.0	.138	73.0	S.	30	1.5	17 9 P				
21	22.3	.177	73.3	S.	227	4.5	30 3 P				
22	24.0	.188	71.0	W.	175	3.5	26 2 P				
23	25.7	.192	75.3	W.	62	1.	14 4 A				
24	31.0	.182	96.3	W.	75	3.	24 12 P	9 A	12 P	.50	
25	20.3	.143	78.7	N.W.	343	9.	42 12 M	0 A	3 A	.18	T.
26	27.3	.185	86.0	S.S.W.	93	4.5	30 5 P				
27	6.3	.092	68.0	N.W.	390	20.	64 12 M				
28	11.0	.092	84.0	S.W.	91	2.	20 4 P				
29	7.0	.093	69.7	N.N.W.	147	5.5	33 1 P				
30	10.0	.093	85.7	N.W.	101	5.5	33 4 P				
31	4.3	.091	61.7	N.	95	1.5	17 6 A				

* Rain or melted snow at base of tower. ‖ Ttrace. ** Included in following day.

REMARKS.

The weather for the month has been generally characteristic of the season, and but few features are worthy of special note.

The light precipitation and small amount of snow on the ground were probably the most noticeable departures from usual conditions. The precipitation was about 70 per cent. of the January normal and but two inches of snow fell during the month.

The mean barometer pressure was slightly above the normal for January, and the fluctuations, while not especially rapid, were considerable. The total wind movement was about ten per cent. above the usual amount.

The month opened with a storm and low temperature. The temperature continued to fall until —21.5° was reached on the morning of the 2d. This is the lowest temperature observed here since this station was established. On the 10th and 11th the temperature again went below zero, and on the 30th zero was nearly reached. The mean temperature for the month was however nearly normal.

Sleighing began with the year and lasted during most of the time until the 16th.

J. E. OSTRANDER, Meteorologist.
A. C. MONAHAN, Observer.

Correction. The annual precipitation in Bulletin No. 120 should be 54.25 in.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of barometer above ground, 51ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 122. FEBRUARY, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.20, 11th, 9P.
Minimum reduced to freezing,	28.79, 13th, 7P.
Reduced† maximum reading,	30.53, 11th, 9P.
Reduced† min. reading,	29.12, 13th, 7P.
Mean tri-daily reduced†,	29.983
Monthly range,	1.41

****Air Temperature.*** In Degrees Fahr.

Highest,	51.0, 20th, 1P.
Lowest,	—10.0, 15th, 8A.
Mean hourly,	21.8
Mean of means of max. and min.,	21.3
Mean sensible (wet bulb),	20.6
Mouthly Range,	61.0
Highest mean daily,	40.3, 20th
Lowest mean daily,	—0.5, 11th
Mean maximum,	29.2
Mean minimum,	13.4
Mean daily range,	15.8
Greatest daily range,	37.5, 15th
Least daily range,	5.5, 12th

Humidity.

Mean dew point,	17.0
Mean force of vapor,	.137
Mean relative humidity,	82.5

Precipitation. In inches.

Total precipitation,	3.56
Number of days on which .01 inch or more rain or melted snow fell,	13
Snow total in inches	21
Snow on ground at end of mouth in Inches,	1

Wind.

Total movement,	4427 m.
Greatest daily movement,	449 m., 13th
Least daily movement,	12 m., 6th
Mean daily movement,	158 m.
Mean hourly velocity,	6.6 m.
Maximum pressure per square foot, 15lbs = 55m. per hour, 13th, 7P., N.	

Prevailing Direction, North West.

Summary.

North,	36 per cent.
South,	11 " "
North West.	29 " "
Other directions	24 per cent.

Weather.

Mean cloudiness observed,	58.0 per cent.
Total cloudiness recorded by the Sun Thermometer,	149 hours or 50.0 per cent.
Number of clear days,	7
Number of fair days,	10
Number of cloudy days,	11

Bright Sunshine.

Number of Hours recorded, 147 hours or 50%

Rain, 3d, 18th, 19th, 21st, 22d, 26th, 27th.

Sleet, 3d, 4th, 16th, 26th.

Snow, 1st, 3d, 4th, 5th, 7th, 8th, 12th, 13th, 16th, 18th, 19th 27th.

No. days sleighing, 25

Gales, of 35 or more miles per hour, 49m., 8th., N.W.; 47m., 9th, W.N.W.; 51m., 10th, W.; 55m., 13th, N.; 45m., 14th, N.; 35m., 19th, N.W.; 36m., 23d, N.W.; 39m., 24th, N.W.; 37m., 27th, W.

* Temperature in ground shelter.

† Reduced to freezing and sea level.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.&MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.27	29.97	30.208	18.5	3 P	7.5	6 A	13.0	14.0	12.0	8
2	30.26	30.19	30.221	30.	4 P	13.	7 A	21.5	19.4	17.1	8
3	30.22	29.80	30.017	24.	9 P	18.	1 A	21.0	20.9	21.0	0
4	30.22	29.69	29.946	32.	12 M	11.	12 P	21.5	24.0	23.4	6
5	30.23	30.10	30.150	23.	3 P	2.5	6 A	12.7	14.2	16.6	1
6	30.17	29.97	30.057	32.	3 P	10.	6 A	21.0	20.2	19.3	7
7	29.99	29.86	29.941	26.	2 P	16.5	6 A	21.2	21.0	21.5	2
8	29.86	29.31	29.508	21.	6 A	11.	12 P	16.0	16.2	15.8	0
9	30.00	29.59	29.847	11.	0 A	-2.	12 P	4.5	2.5	0.6	8
10	30.31	30.00	30.114	4.5	2 P	-5.5	7 A	-0.5	-0.1	-1.4	10
11	30.53	30.31	30.496	8.	4 P	-9.5	8 A	-0.8	-0.5	-1.5	6
12	30.50	30.26	30.373	5.	2 P	-0.5	0 A	2.2	4.3	4.1	0
13	30.26	29.12	29.645	10.	12 P	2.	8 A	6.0	5.7	5-7	0.
14	30.36	29.17	29.957	20.5	3 P	4.	12 P	12.2	12.8	12.7	8
15	30.50	30.36	30.433	27.5	4 P	-10.	8 A	8.8	12.2	12.0	8
16	30.35	29.93	30.178	38.	3 P	8.5	6½ A	23.2	25.2	24.4	5
17	29.93	29.86	29.877	45.5	3 P	27.5	5 A	36.5	36.4	35.2	3
18	29.93	29.60	29.800	43.	3 P	29.5	12 P	36.3	34.7	33.7	3
19	29.71	29.55	29.623	41.	3 P	30.	1 A	35.5	35.2	32.2	8
20	29.70	29.54	29.592	57.	1 P	28.	1 A	39.5	40.3	36.2	8
21	29.73	29.66	29.716	42.	12 M	27.5	6 A	34.7	36.0	34.8	0
22	29.68	29.46	29.577	44.	4 P	31.	6 A	37.5	37.2	37.0	1
23	29.85	29.54	29.688	40.5	1 A	27.	12 P	33.8	35.6	32.0	8
24	30.33	29.85	30.144	32.5	3 P	21.	12 P	26.8	26.2	22.7	11
25	30.50	30.33	30.456	34.	2 P	13.	6 A	23.5	24.5	21.6	11
26	30.50	30.05	30.346	33.	9 P	11.5	6 A	22.3	24.3	25.5	0
27	30.05	29.69	29.783	42.	11 A	32.	12 P	37.0	36.3	34.5	6
28	30.08	29.84	29.970	38.5	4 P	21.	6 A	29.8	31.8	29.3	11

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN. *	TOTAL IN INCHES. SNOW.
1	5.0	.088	70.0	N.N.W.	206	4.	28	10 A	1 A			T.
2	11.3	.110	73.0	W.	33	0..	—	—				
3	19.7	.117	92.7	N.	37	1.	14	12 P	9 A	12 P	**	**
4	21.0	.134	87.7	N.	164	3.5	26	12 M	0 A	7 A	.85	4
5	15.3	.098	93.3	N.	14	0.	—	—	9 A	6 P	.04	1
6	16.3	.115	84.7	N.	12	0.	—	—				
7	19.7	.119	92.7	N.	123	2.	20	6 A	4 A	12 P	**	**
8	12.7	.096	86.3	N.	265	12.	49	10 P	0 A	6 P	.45	6
9	-3.7	.048	81.0	N.W.	334	11.	47	2 P				
10	-3.7	.043	89.3	N.W.	320	13.	51	8 A				
11	-3 3	.044	88.3	N.W.	204	5.	32	1 P				
12	1.7	.056	87.0	N.	166	4.	28	3 P	8 A	12 P	**	**
13	5.3	.059	98.3	N.	449	15.	55	7 P	0 A	12 P	1.20	10
14	7.7	.087	77.7	N.W.	360	10.	45	5 A				
15	8.0	.098	79.3	S.	139	4.5	30	5 P				
16	21.3	.150	85.7	W.	77	2.	20	0 A	8 P	12 P	.11	T.
17	31.0	.230	80.0	S.W.	111	1.	14	12 P				
18	30.3	.211	86.0	S.	120	1.5	17	0 A	4 P	12 P	.25	T.
19	24.0	.215	64.0	N.W.	160	6.	35	12 M	0 A	2 A	.04	T.
20	29.3	.259	65.7	S.	170	2.5	22	9 A				
21	33.0	.213	90.0	E.	47	0.	—	—	12 M	4 P	.02	
22	34.3	.235	86.3	S.W.	78	3.	24	12 P	5 A	9 A	T	
23	27.0	.203	74.0	N.W.	205	6.5	36	1 P				
24	18.0	.136	74.7	N.W.	186	7.5	39	6 A				
25	15.0	.139	69.0	N.	70	1.	14	2 A				
26	25 3	.143	100.	N.	32	1.5	17	9 P	10 A	12 P	**	**
27	30.3	.218	80.3	N.W.	137	7.	37	3 P	0 A	9 A	.60	T
28	24.0	.184	72.7	S.S.W.	208	5.	32	1 A				

* Rain or melted snow at base of tower. ‖ Ttrace. ** Included in following day.

REMARKS.

The weather of the past month has been generally cold and unpleasant, with storms well distributed over the period.

A comparison of the records here with those of previous years shows an excess of precipitation of more than 10% over the normal, and an unusually large snow fall, while the mean temperature was over 3 degrees below the February average.

The mean barometer and total wind movement were both below the normal. The relative humidity was considerably above the mean.

The month opened with a couple of days of good winter weather, followed by a storm of rain, hail and snow on the 3d and 4th. Another storm was noted on the 7th and 8th. This was followed by a decided drop in the temperature with continued cold for several days, the temperature falling to nearly —10 degrees on the 11th.

On the 12th a snow storm accompanied by a high wind set in, which continued throughout the 13th. This proved to be the most severe storm of the season thus far. Nearly a foot of snow fell which drifted so badly that travel was blocked for a considerable time. During this storm the barometer fell 1.2 inches in 24 hours.

Several storms of less severity occurred later in the month accompanied, however, with but little snow.

On the 4th sleighing began and continued throughout the remainder of the month, though in poor condition at the close.

J. E OSTRANDER, Meteorologist.

A. C. MONAHAN, Observer.

Department of Liberal Arts.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 123. MARCH, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.18, 14th, 12 P.
Minimum reduced to freezing, 28.64, 19th, 6 P.
Reduced† maximum reading, 30.49, 14th, 12 P.
Reduced† minimum reading, 28.95, 19th, 6 P.
Mean tri-daily reduced, ... 29.942
Monthly range, ... 1.54

****Air Temperature.*** In Degrees Fahr.

Highest, ... 52.0, 12th
Lowest, ... 10.0, 21st
Mean hourly, ... 30.6
Mean of means of max. and min., ... 33.6
Mean sensible (wet bulb), ... 29.3
Monthly range, ... 42.0
Highest mean daily, ... 43.1, 12th
Lowest mean daily, ... 21.2, 17th
Mean maximum, ... 41.0
Mean minimum, ... 26.2
Mean daily range, ... 14.8
Greatest daily range, ... 35.0, 27th
Least daily range, ... 4.5, 15th

Humidity.

Mean dew point, ... 25.5
Mean force of vapor, ...180
Mean relative humidity, ... 79.1

Precipitation. In inches.

Total precipitation, ... 7.13
Number of days on which .01 inch or more rain or melted snow fell, ... 14
Snow total in inches, ... 27
Snow on ground at end of month in inches, 3

Wind.

Total movement, ... 5275 m.
Greatest daily movement, ... 438 m., 7th
Least daily movement, ... 22 m., 9th
Mean daily movement, ... 170 m.
Maximum pressure per square foot, 22 lbs.= 66 m. per hour, on 7th, 12 M., N. E.
Prevailing Direction, North-northwest.

Summary.

North, ... 34 per cent.
Northwest, ... 34 " "
Northeast, ... 13 " "
Other directions, ... 19 " "

Weather.

Mean cloudiness observed, . . . 66 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 236 hrs.=64 per cent.
Number of clear days, ... 7
Number of fair days, ... 7
Number of cloudy days, ... 17

Bright Sunshine.

Number of hours recorded, . . . 134 hrs.=36%

Rain. 4th, 5th, 11th, 12th, 15th, 18th, 19th, 22d, 23d, 28th, 29th.

Sleet, 4th, 15th, 19th.

Snow. 2d, 4th, 7th, 9th, 15th, 18th, 19th, 22d, 23d, 26th, 28th, 29th, 31st.

No. days sleighing, 13.

Thunder and Lightning, 12th, 19th.

Gales, 37 m. 1st, N. W.; 40 m., 5th, S. W.; 39 m., 6th, S.; 66 m., 7th, N. E.; 39 m., 8th, N. W.; 35 m., 11th, S.; 36 m., 12th, S. S. W.; 40 m., 13th, N.W.; 36 m., 16th, N. W.; 43 m., 19th, N.; 62 m., 20th, N.; 35 m., 21st, N. W.; 61 m., 29th, N. W.; 53 m., 30th, W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.09	29.78	29.951	40.5	3 P	23.0	12 P	32.3	32.8	28.2	5
2	30.17	30.05	30.087	31.0	10 A	19.0	7 A	25.0	27.3	27.5	0
3	30.22	30.05	30.192	41.0	3 P	27.0	5 A	34.0	34.1	33.3	4
4	30.21	29.96	30.048	39.0	12 M	31.0	6 A	35.0	35.1	34.8	0
5	29.96	29.32	29.541	48.5	6 P	32.5	6 A	40.5	37.3	36.0	0
6	30.04	29.65	29.993	49.0	5 P	29.0	12 P	39.0	37.2	31.8	11
7	29.93	29.31	29.469	37.0	6 A	21.0	12 P	29.0	29.1	28.2	2
8	30.26	29.62	30.089	33.0	3 P	18.0	4 A	25.5	24.7	23.8	8
9	30.26	30.05	30.135	32.0	3 P	13.5	6 A	22.7	25.1	26.0	3
10	30.39	30.11	30.358	39.5	4 P	17.5	6:30 A	28.5	29.6	26.3	11
11	30.39	30.01	30.174	41.0	2 P	31.0	5 A	36.0	36.3	36.3	0
12	30 01	29.62	29.726	52.0	12 M	37.5	5 A	44.7	43.1	44.4	1
13	30.33	29.77	30.128	43.0	3 P	35.0	5 A	39.0	37.0	33.7	6
14	30.49	30.33	30.449	36.0	4 P	26.0	5 A	31.0	30.5	28.5	1
15	30.49	29.58	30.047	32.0	12 M	27.5	6 A	29.7	30.0	30.5	0
16	30.13	29.57	29.890	39.5	2 P	23.0	12 P	31.2	33.0	31.0	10
17	30.28	30.13	30.259	30.0	4 P	12.0	6 A	21.0	21.2	19.2	12
18	30.26	29.64	29.921	29.5	9 P	15.5	8 A	22.5	21.9	22.7	0
19	29.64	28.95	29 218	34.5	2 P	25.5	2 A	30.0	30.2	31.7	0
20	30.09	29.14	29.755	29.0	7 A	18.0	12 P	23.5	25.3	22.8	6
21	30.40	30.09	30.359	33.0	5 P	10.0	6 A	21.5	23.3	22.2	10
22	30.34	30.03	30.183	32.0	2 P	24.5	6 A	28.3	29.0	29.5	0
23	30.03	29.68	29.782	33.0	4 P	27.0	11 P	30.0	30.5	30.2	0
24	29.88	29.78	29.904	34.0	2 P	17.5	6 A	25.7	27.7	26.3	8
25	29.98	29.75	29.882	34.0	5 P	12.0	6 A	23.0	26.0	23.1	10
26	30.03	29.59	29.776	36.5	5 P	20.5	8 A	28.5	26.7	25.0	5
27	30.18	30.03	30.155	51.0	4 P	16.0	3 A	33.5	32.4	30.2	11
28	30.17	29.41	29.899	39.0	1 P	24.0	6 A	31.5	32.1	32.2	0
29	29.60	29.00	29.323	36.5	7 A	27.0	9 P	31.8	31.9	30.0	4
30	29.84	29.60	29.802	35.0	6 P	24.0	6 A	29.5	30.6	27.3	6
31	29.79	29.64	29.706	51.0	2 P	27.0	6 A	39.0	36.5	34.2	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	20.3	.180	66.0	W.	189	7.	37	12 M				
2	26.0	.153	94.0	N.	91	2.	20	12 P	9 A	12 P	.46	6
3	30.3	.206	83.7	N.N.E.	172	3.	25	8 A				
4	33.3	.210	91.3	N.E.	73	1.	14	9 A	5 A	2 P	.17	T
5	33.7	.224	89.3	N.W.	96	8.	40	6 P	1 A	6 P	.86	
6	25.3	.210	70.0	N.W.	116	7.5	39	1 P				
7	26.3	.213	92.7	N.N.E.	438	22.	66	12 M	6 A	6 P	.20	2
8	20.7	.140	81.0	N.W.	300	7.5	39	1 A				
9	23.3	.149	88.0	W.	22	0.	—	—	2 P	5 P	T.	T
10	21.3	.162	77.0	N.	88	3.	25	9 A				
11	34.0	.228	87.0	S.	306	6.	35	1 P	8:30 A	10 A	T.	
12	44.0	.298	97.7	S.W.	276	6.5	36	11 A	1 P	8 P	.23	
13	27.3	.223	70.0	N.W.	226	8.	40	2 A				
14	23.3	.174	74.7	N.E.	105	1.	14	8 P				
15	28.7	.173	91.3	E.S.E.	143	4.	28	9 P	9 A	12 P	1.03	2
16	25.7	.200	73.7	N.W.	252	6.5	36	8 A				
17	13.3	.119	70.7	N.	173	2.5	22	7 A				
18	21.3	.127	94.3	N.N.W.	35	0.	—	—	3 A	12 P	**	**
19	31.3	.178	100.0	N.	100	9.	43	12 P	0 A	12 P	1.48	4
20	14.7	.140	64.7	N.W.	412	19.	62	8 A				
21	14.7	.135	68.7	N.W.	120	6.	35	0 A				
22	27.7	.167	94.7	N.E.	128	0.5	10	2 P	6 A	12 P	**	**
23	28.0	.174	89.3	N.	150	3.	25	7 P	0 A	5:30 P	1.05	6
24	22.7	.155	82.7	N.	170	5.	32	2 P				
25	19.3	.138	80.0	N.W.	85	2.5	22	1 P				
26	22.0	.144	86.7	N.	166	5.5	33	12 M	4 A	11 A	.50	6
27	26.3	.192	78.3	N.	66	1.	14	10 A				
28	30.0	.188	91.7	S.E.	73	2.5	23	1 P	9 A	12 P	**	T
29	25.7	.180	80.7	N.W.	330	18.5	61	9 P	0 A	8 P	1.03	T
30	21.0	.170	67.7	N.	347	14.	53	8 A				
31	28.7	.227	76.0	N.	27	1.	14	7 P	4 A	9 A	.12	1

*Rain or melted snow at base of tower.

University of Id
Department of Liberal Ar

REMARKS.

March has proved to be a stormy and disagreeable month and presented a marked contrast to the conditions prevailing a year ago. Gales and rain and snow storms have been of frequent occurrence and generally distributed throughout the month so that the equinoctial period, though stormy, is lacking in prominence.

Comparisons of some of the weather elements with normal conditions show the following characteristics of interest. The barometric fluctuations have been especially noticeable and the range unusually large. The rapid changes on the 7th and 8th, the 19th and 20th and the 28th and 29th are the most marked. The mean pressure for the month is slightly below the normal.

The precipitation was abnormally large being more than twice the monthly mean and the greatest for the month of March on the records of this station. The snowfall was also much more than usual. The relative humidity and per cent. of cloudiness were both considerably above the normal. While the gales of more than 35 miles per hour were frequent the total wind movement was considerably below the March average.

The mean temperature was nearly normal and the range considerably below the average.

At the close of the month snow still covered a greater part of the ground and the prospects for beginning work on the ground at an early date not promising.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 124. APRIL, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.08, 6th, 7 A.
Minimum reduced to freezing,	29.19, 8th, 4 P.
Reduced† maximum reading,	30.39, 6th, 7 A.
Reduced† minimum reading,	29.49, 8th, 4 P.
Mean tri-daily reduced,	30.043
Monthly range,	.90

****Air Temperature.*** In Degrees Fahr.

Highest,	82.0, 30th, 2-30 P.
Lowest,	21.0, 3d, 6 A.
Mean hourly,	46.1
Mean of means of max. and min.,	45.8
Mean sensible (wet bulb),	42.4
Monthly range,	61.0
Highest mean daily,	61.2, 30th
Lowest mean daily,	30.8, 2d
Mean maximum,	58.8
Mean minimum,	32.7
Mean daily range,	26.1
Greatest daily range,	47.0, 29th
Least daily range,	9.5, 2d

Humidity.

Mean dew point,	36.5
Mean force of vapor,	.362
Mean relative humidity,	69.2

Precipitation. In inches.

Total precipitation,	1.79
Number of days on which .01 inch or more rain or melted snow fell,	8
Snow total in inches,	1

Wind.

Total movement,	3984 m.
Greatest daily movement,	251 m., 17th
Least daily movement,	51 m., 22d
Mean daily movement,	132.8 m.
Mean hourly velocity,	5.5

Maximum pressure per square foot, 9.5 lbs.= 44 m. per hour, on 17th, 5 P., N. W.

Prevailing Direction, West.

Summary.

Northwest,	27 per cent.
North,	10 " "
West,	13 " "
South,	13 " "
East Southeast,	10 " "
South Southwest,	10 " "
Other directions,	17 " "

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	121 hrs.=30 per cent.
Number of clear days,	17
Number of fair days,	10
Number of cloudy days,	3

Bright Sunshine.

Number of hours recorded, 280 hrs.=70%

Rain, 2d, 7th, 8th, 12th, 14th, 16th, 20th, 21st, 25th, 26th.

Snow, 16th.

Last Frost, 22d.

Thunder and Lightning, 14th, 25th.

Gales, 35 miles or more per hour, 39 m., 1st, N.W.; 43 m., 2d, N. W.; 35 m., 5th, N.; 42 m., 9th, N.W.; 44 m., 17th, N. W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.85	29.72	29.817	38.0	4 P	27.5	12 P	32.7	33.9	29.8	8
2	29 98	29.85	29.930	35.0	4 P	25 5	12 P	30.2	30.8	27.8	7
3	30.10	29.96	30 034	43 0	4 P	21.0	6 A	32.0	33.9	31.7	12½
4	30.15	30.06	30.116	46.0	4 P	23.0	5 A	34.5	35.8	32.7	12½
5	30.33	30.12	30.236	43.5	4 P	24.0	3 A	33.8	35.2	31.2	13
6	30.39	30.27	30.332	53.0	5 P	22.5	6 A	37.7	38.3	34.2	13
7	30.27	29.85	30.143	50.0	1 P	29.5	5 A	39.7	39 6	35.3	2
8	29.85	29.49	29.569	56.0	3 P	39.0	12 P	47.5	44 4	44.5	6
9	29.95	29 55	29 749	45.5	1 P	34.0	5 A	39.8	39.1	36.7	5
10	30.19	29.95	30.068	49.0	4 P	27.5	6 A	38.3	39.5	37.0	13
11	30.30	30.19	30.256	51.5	4 P	25.0	5 A	38.3	39.3	34.3	13
12	30.20	29.78	29.931	45.0	1 P	28.0	5 A	36.5	37.2	37.3	0
13	29.95	29 74	29.871	59.0	4 P	34.5	4 A	46.7	48.7	43.2	11
14	29.98	29.72	29.819	68.0	3 P	35.5	5 A	51.8	51.8	47.3	10
15	29.95	29.87	29 920	62.0	4 P	36.5	6 A	49.2	52.3	44.5	13
16	29.94	29.70	29.797	42.0	11 A	30.0	5 A	36.0	35.9	35.0	0
17	30.09	29.80	29.974	54.0	4 P	33.0	2 A	45.5	44.5	39.5	13
18	30.17	30.02	30.100	71.0	4 P	28.0	5 A	49 5	51.0	47.0	13
19	30.21	30.09	30.147	68.0	3 P	33.0	5 A	50.5	50.9	49.7	11
20	30.26	30.17	30.209	57.0	4 P	38.0	5 A	47.5	48.4	43.3	5
21	30.30	30.15	30.227	55.0	4 P	35.0	12 P	45.0	46.6	41.3	4
22	30.29	30.19	30.230	68.0	3 P	26.0	5 A	47.0	49.1	44.3	13
23	30.21	30.06	30.132	76.0	2 P	38.0	5 A	57.0	56.6	52.2	13
24	30.21	30.06	30.143	72.5	4 P	39.0	6 A	55.7	54.2	49.7	13
25	30.09	29.86	29.950	79.5	2-30 P	44.5	5 A	62.0	59.5	56.7	5
26	30.03	29.86	29.915	75.0	4 P	49.0	6 A	62.0	61.0	57.5	6
27	30.27	30.03	30.183	69.0	2 P	40.0	12 P	54.5	54.2	49.7	5
28	30 29	30.16	30.225	71.0	4 P	35.0	5 A	53.0	52.7	47 2	14
29	30.23	30.09	30.161	81.0	4 P	34.0	5 A	57.5	58.5	53.3	14
30	30.19	30.02	30.093	82.0	2-30 P	47.5	5 A	64.7	61.2	57.7	12

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	23.3	.186	71.7	N.W.	187	7.5	39	2 P				
2	22.0	.172	71.7	W.N.W.	245	9.	43	11 A	3 P	—	T	
3	25.7	.205	69.3	N.W.	144	4.	28	11 A				
4	25.7	.220	66.0	N.W.	71	1.	14	11 A				
5	19.7	.217	52.0	N.	216	6.	35	12 M				
6	26.7	.247	65.0	N.	74	1.	14	11 P				
7	28.7	.245	70.0	S.	110	1.	14	1 P	6 P	12 P	.36	T
8	41.7	.321	85.3	N.E.	126	4.	28	1 A	0 A	7 A	.40	
9	32.0	.245	75.3	W.	230	9.	42	1 P				
10	33.0	.247	79.0	W.	116	1.5	17	2 P				
11	27.7	.240	69.7	N.W.	88	3.5	26	10 A				
12	35.3	.236	88.3	S.W.	67	1.5	17	2 P	9 A	4 P	.14	
13	36.3	.355	63.7	N.W.	206	5.5	33	2 P				
14	42.0	.424	70.7	S.W.	67	2.5	22	2 P	1 A	7 A	.07	
15	37.0	.381	59 7	N.W.	144	4.5	30	3 P				
16	33.0	.211	90.7	N.	104	1.5	17	6 P	8:30 A	12 P	.77	1
17	32.0	.306	62.3	N.W.	251	9.5	44	5 P				
18	44.0	.413	77.7	N.W.	52	1.	14	12 M				
19	47.0	.413	83.0	E.S.E.	137	3.	24	6 P				
20	36.7	.349	65 0	E.S.E.	72	1.5	17	11 P	11 A	5 P	T	
21	35.7	.313	69.3	E.S.E.	186	1.	14	5 P	6 A	7 A	.01	
22	36.3	.411	62.0	S.	51	1.	14	7 P				
23	45.0	.571	57.3	W.	112	2.	20	2 P				
24	42.7	.488	62.0	W.	102	3.	24	7 P				
25	51.7	.637	65.7	S.	99	2.	20	4 P	2 A	9 P	.02	
26	53.7	.603	72.0	N.E.	124	3.5	26	1 P	3 A	4 A	.02	
27	43.3	.473	63.7	S.S.W.	82	2.	20	6 P				
28	38.0	.468	56.7	S.	136	3.	24	6 P				
29	47.0	.602	63.7	S.S.W.	178	3.	24	4 P				
30	52.7	.666	66.7	S.S.W.	207	4.	28	3 P				

*Rain or melted snow at base of tower.

REMARKS.

The weather during April presents a marked contrast with the conditions prevailing during March, and also with those of a year ago. Disagreeable elements have been almost wholly absent, and more pleasant weather for this period of the year could scarcely be asked for by the most exacting. The early part of the month was rather cool owing to the considerable amount of snow remaining on the ground in places. Prevailing fair weather advanced the season rapidly, and although still somewhat backward at the close of the month the progress during the period was very encouraging.

The records of the month show a nearly normal barometer with an unusually small range: a mean temperature slightly higher than the average: a relative humidity and dew-point slightly above the normal. The small amount of cloudiness and exceptionally large number of clear and fair days are the most noticeable features of the weather for the month. The precipitation while but about two-thirds the normal amount is greater than in 1890, 1892, and 1896, as shown by our records extending back for ten years. The total wind movement is the smallest April record at this station.

The roads are generally dry in this vicinity but need the usual spring repairs.

Considerable ploughing has already been done and the work of the season well started.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 125. MAY, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.99, 24th, 7 A.
Minimum reduced to freezing, 29.41, 9th, 2 P.
Reduced† maximum reading, 30.29, 24th, 7 A.
Reduced† minimum reading, 29.69, 9th, 2 P.
Mean tri-daily reduced, ... 30.000
Monthly range, ...60

****Air Temperature.*** In Degrees Fahr.

Highest, ... 88.5, 1st, 3 P.
Lowest, ... 33., 4th, 5 A.
Mean hourly, ... 55.7
Mean of means of max. and min., ... 57.6
Mean sensible (wet bulb), ... 53.4
Monthly range, ... 55.5
Highest mean daily, ... 70.0, 31st
Lowest mean daily, ... 46.8, 16th
Mean maximum, ... 71.2
Mean minimum, ... 44.0
Mean daily range, ... 27.2
Greatest daily range, ... 40.0, 24th
Least daily range, ... 6.5, 19th

Humidity.

Mean dew point, ... 48.6
Mean force of vapor, ...534
Mean relative humidity, ... 70.3

Precipitation. In inches.

Total precipitation, ... 1.28
Number of days on which .01 inch or more rain or melted snow fell, ... 9

Wind.

Total movement, ... 4219 m.
Greatest daily movement, ... 284 m., 27th
Least daily movement, ... 48 m., 16th
Mean daily movement, ... 136. m.
Mean hourly velocity, ... 5.7
Maximum pressure per square foot, 10.5 lbs.= 46 m. per hour, on 1st, 7.30 P., S. S. W.
Prevailing Direction, Southwest.

Summary.

Southwest, ... 26 per cent.
South southwest, ... 13 " "
Northeast, ... 13 " "
North, ... 10 " "
Other directions, ... 38 " "

Weather.

Mean cloudiness observed, ... 54 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 232 hrs.=51 per cent.
Number of clear days, ... 7
Number of fair days, ... 12
Number of cloudy days, ... 12

Bright Sunshine.

Number of hours recorded, . . . 221 hrs.=49%

Rain, 1st, 2d, 11th, 13th, 16th, 17th, 18th, 19th, 20th, 28th, 29th.

Last Frost, 4th.

Thunder and Lightning, 1st, 28th.

Gales, 35 miles or more per hour, 46 m., 1st, S.S.W.; 37 m., 3d, S.S.E.; 36 m., 9th, N.; 42 m., 14th, N.; 39 m., 24th, N.N.W.; 35 m., 30th, W.N.W.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.07	29.86	29.976	88.5	3 P	52.0	5 A	70.2	66.9	63.5	7
2	29.97	29.76	29.865	84.0	4 P	56.0	5 A	70.0	68.0	64.5	5
3	30.20	29.79	30.058	65.5	6 P	40.0	12 P	52.7	55.1	49.3	7
4	30.21	30.02	30.117	69.0	5 P	33.0	5 A	51.0	52.9	45.8	14
5	30.25	30.12	30.195	69.5	4 P	39.0	5 A	54.3	55.2	48.7	14
6	30.28	30.10	30.167	70.5	3 P	37.5	5 A	54.0	54.3	51.2	3
7	30.10	29.88	29.971	81.5	3 P	43.0	5 A	62.3	62.8	56.7	14
8	29.96	29.73	29.825	71.0	4 P	48.5	2 A	59.7	59.6	53.5	6
9	29.94	29.69	29.774	75.0	3 P	51.5	5 A	63.3	62.0	51.5	7
10	30.08	29.94	30.049	76.0	5 P	36.5	5 A	56.2	59.0	51.2	14
11	30.04	29.74	29.853	68.0	10 A	42.0	5 A	55.0	53.1	50.0	3
12	29.95	29.77	29.852	73.0	5 P	44.0	4 A	58.5	59.3	53.2	12
13	30.00	29.88	29.928	72.0	1-30 P	38.0	5 A	55.0	55.0	53.7	3
14	30.14	29.95	30.081	65.5	3 P	43.0	7 A	54.2	54.4	46.2	10
15	30.16	30.03	30.106	63.5	4 P	37.0	5 A	50.2	51.7	46.3	12
16	30.11	29.86	29.897	55.0	2-30 P	36.0	5 A	45.5	46.8	45.7	0
17	30.05	29.87	29.996	69.5	5-30 P	44.0	5 A	56.8	54.9	52.2	14
18	30.11	30.01	30.062	54.0	2 P	46.0	2 A	50.0	50.0	47.7	0
19	30.02	29.85	29.910	52.5	2 P	46.0	5 A	49.5	49.0	48.3	0
20	29.85	29.75	29.791	62.0	3 P	41.0	4 A	51.5	51.4	50.3	5
21	30.02	29.78	29.893	61.5	1 P	43.5	2 A	52.5	53.0	51.0	4
22	30.18	30.02	30.110	66.0	1-30 P	40.0	6 A	53.0	53.5	50.0	8
23	30.21	30.16	30.193	69.0	5 P	47.5	5 A	58.3	57.2	52.8	5
24	30.29	30.16	30.236	78.0	4 P	38.0	4 A	58.0	58.8	55.2	8
25	30.25	30.13	30.183	78.0	4 P	40.5	5 A	59.3	60.7	56.0	10
26	30.19	30.03	30.114	79.0	1 P	46.0	5 A	62.5	63.4	58.3	8
27	30.06	29.86	29.904	81.0	1 P	51.0	4 A	66.0	65.5	60.3	4
28	30.13	29.81	29.951	78.5	11 A	50.0	12 P	64.2	65.2	61.8	3
29	30.19	29.99	30.118	62.5	5 P	50.0	3 A	56.3	55.3	54.8	0
30	30.01	29.85	29.918	82.0	3 P	50.0	4 A	66.0	65.6	62.8	7
31	29.99	29.85	29.923	85.0	3 P	53.0	3 A	69.0	70.0	63.0	12

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	60.0	.799	73.0	S.S.W.	134	10.5	46	7-30 P	4 P	12 P	.31	
2	61.7	.747	79.3	S.W.	91	2.	20	8 P	7:30 A		T	
3	43.7	.443	67.3	E.N.E.	225	7.	37	7 P				
4	37.0	.427	59.3	N.N.W.	81	2.5	22	1 P				
5	42.0	.461	61.3	W.	112	4.	28	6 P				
6	51.0	.479	76.7	S.S.W.	144	2.	20	2 P				
7	50.3	.665	62.7	S.W.	105	2.5	22	12 M				
8	46.0	.557	56.7	N.E.	158	1.5	17	8 P				
9	41.0	.581	47.0	N.N.E.	261	6.5	36	2 P				
10	43.7	.545	57.7	N.W.	114	3.	24	10 A				
11	47.0	.390	86.0	S.W.	154	5.	32	1 P	1 P	4 P	.24	
12	46.7	.549	61.0	N.W.	153	4.5	30	3 P				
13	49.7	.510	75.0	S.W.	67	4.	28	4 P	2:30 P	11 P	.07	
14	42.0	.427	65.0	N.	244	9.	42	6 P				
15	39.0	.411	60.7	N.N.W.	147	3.5	26	4 P				
16	42.0	.354	76.3	S.E.	48	11.5	17	2 P	0:30 P	12 P	.19	
17	47.0	.484	71.7	N.E.	96	3.	24	10 P	0 A	3 A	.02	
18	44.0	.379	76.7	S.E.	158	2.5	22	2 P	7:30 A	12 P	.07	
19	46.3	.363	88.0	S.W.	59	0.	—		0 A	5 P	.08	
20	47.7	.416	82.3	N.	118	2.5	22	7 A	11 A		T	
21	45.3	.445	69.0	N.	273	7.5	39	8 A				
22	46.0	.439	74.3	N.E.	114	4.	28	11 A	7:30 P		T	
23	47.3	.514	67.0	N.E.	72	1.5	17	4 P				
24	50.0	.583	67.7	S.W.	58	2.5	22	5 P				
25	51.7	.594	68.3	S.	116	1.5	17	2 P				
26	54.3	.644	69.3	S.S.W.	126	2.	20	4 P				
27	56.0	.680	70.7	S.S.W.	284	5.	32	10 P				
28	59.3	.643	83.3	E.S.E.	109	2.	20	5 P	4 P	12 P	.20	
29	53.7	.450	93.0	S.	87	3.	24	8 P	0 A	6 A	.10	
30	59.0	.733	74.3	S.W.	202	6.	35	2 P				
31	56.7	.848	58.0	S.W.	109	2.	20	11 A				

*Rain or melted snow at base of tower.

REMARKS.

The conditions which prevailed during last month have continued for the most part through the whole of this and as a result the season has been more than usually pleasant. Storms of wind and rain have been infrequent and none of any severity have been noted.

The small precipitation has been the most marked feature of the month following as it did the small rainfall of April. The total for the month was less than a third of the usual amount and the smallest for the period on record here.

The mean barometric pressure was slightly above the normal and the range unusually small. The wind movement was about ten per cent below the average and the maximum velocity low. Changes of direction were rather frequent.

The mean temperature was nearly normal although the maximum and minimum for the month were both rather high. The relative humidity was above the normal. The usual amount of cloudiness was observed.

The first two weeks were warm and generally clear. The third week cooler and more cloudy weather prevailed. The last part of the month grew warmer, the maximum temperature however not equaling that of the first.

The progress of the season is fully up to the average although the results of the dry weather are apparent. Grass shows most plainly the lack of rain and promises to be a light crop. Heavy rains would still greatly improve it and materially help other growing crops.

The spring work on the roads is generally over and they are in good condition in this vicinity.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 126. JUNE, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.96, 23d, 7 A.
Minimum reduced to freezing,	29.38, 20th, 4 P.
Reduced† maximum reading,	30.25, 23d, 7 A.
Reduced† minimum reading,	29.66, 20th, 4 P.
Mean tri-daily reduced,	29.983
Monthly range,	.59

****Air Temperature.*** In Degrees Fahr.

Highest,	93.0, 5th, 3 P.
Lowest,	42., 11th, 6 A.
Mean hourly,	67.4
Mean of means of max. and min.,	67.8
Mean sensible (wet bulb),	61.2
Monthly range,	51.0
Highest mean daily,	81.5, 6th
Lowest mean daily,	61.2, 16th
Mean maximum,	80.6
Mean minimum,	55.1
Mean daily range,	25.5
Greatest daily range,	37.0, 20th
Least daily range,	7.0, 25th

Humidity.

Mean dew point,	59.5
Mean force of vapor,	.741
Mean relative humidity,	74.0

Precipitation. In inches.

Total precipitation,	4.13
Number of days on which .01 inch or more rain or melted snow fell,	8

Wind.

Total movement,	3814 m.
Greatest daily movement,	265 m., 23d
Least daily movement,	59 m., 19th, 26th
Mean daily movement,	127. m.
Mean hourly velocity,	5.3
Maximum pressure per square foot,	7.5 lbs.= 39 m. per hour, on 6th, 4.00 P., N. W.
Prevailing Direction,	West Southwest.

Summary.

Southwest,	17 per cent.
South southwest,	13 " "
South,	13 " "
North,	27 " "
Other directions,	30 " "

Weather.

Mean cloudiness observed,	54 per cent.
Total cloudiness recorded by the Sun Thermometer,	222 hrs.=49 per cent.
Number of clear days,	3
Number of fair days,	21
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, . . . 235 hrs.=51%

Rain, 1st, 9th, 14th, 15th, 20th, 23d, 24th, 25th, 28th, 29th.

Thunder and Lightning, 1st, 15th, 23d, 24th, 25th.

Aurora, 29th.

Gales, 35 miles or more per hour, 39 m., 6th, N.W.; 36 m., 20th, S.W.; 35 m., 23d, S.W.; 35 m., 30th, N.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.86	29.76	29.824	86.5	4 P	57.5	5 A	72.0	72.7	68.2	7
2	29.94	29.81	29.877	84.5	4 P	62.0	5 A	73.3	71.8	69.2	6
3	30.08	29.94	30.028	81.0	3 P	53.0	4 A	67.0	67.7	62.0	9
4	30.12	30.00	30.049	80.5	3 P	48.5	4 A	64.5	66.1	62.5	10
5	30.00	29.84	29.912	93.0	3 P	60.5	5 A	76.7	76.1	70.7	8
6	29.89	29.85	29.868	90.5	4 P	71.5	5 A	81.0	81.5	73.0	6
7	30.01	29.89	29.944	88.5	2-30 P	57.0	12 P	72.7	71.7	69.0	3
8	29.98	29.75	29.823	88.5	3 P	55.0	4 A	71.7	70.9	65.5	10
9	29.95	29.87	29.929	74.0	11 A	54.0	6 A	64.0	66.9	62.7	2
10	30.09	29.92	30.009	74.0	5 P	54.0	4 A	64.0	63.7	57.0	9
11	30.20	30.09	30.164	77.0	5 P	42.0	6 A	59.5	62.8	57.2	15
12	30.21	30.05	30.138	78.0	4 P	52.5	3 A	65.3	64.5	62.5	5
13	30.10	29 97	30.025	85.0	3 P	62.0	3 A	73 5	72.0	68.7	6
14	29.97	29.85	29.906	92.0	3 P	65.5	4 A	78.8	75.1	72.3	7
15	29.89	29.72	29.830	84.0	1 P	63.5	4 A	73.7	70.1	68.7	3
16	30.03	29.79	29.941	67.5	4 P	53.0	12 P	60.2	61.2	53.5	12
17	30.12	30.07	30.111	77.0	6 P	48.5	4 A	62.7	62.9	60.0	7
18	30.13	29.98	30.044	80.0	4 P	49.5	5 A	64.7	65.7	62.2	10
19	29.98	29.86	29.914	83.0	3-30 P	50.5	5 A	66.7	64.8	62.2	8
20	29.92	29.66	29.762	87.0	2 P	50.0	4 A	68.5	65.2	64.2	8
21	30.01	29.73	29.871	73.5	3 P	55.0	4 A	64.2	64.7	60.2	8
22	30.22	30.02	30.160	75.5	4 P	51.5	4 A	63.5	64.0	58.2	10
23	30.25	30 08	30.184	76.5	4 P	58.5	4 A	67.5	66.1	62.0	8
24	30.15	30.01	30.088	87.5	1-30 P	61.5	4 A	74.5	70.7	69.5	8
25	30.10	30 00	30.047	67.0	7 A	60.0	12 P	63.5	63.8	63.2	0
26	30.10	30.03	30.057	81.0	1 P	54.0	12 P	67.5	67.8	63.3	10
27	30.12	30.03	30.069	78.5	3 P	46.5	4-30 A	62.5	64.8	59.3	11
28	30.07	29.82	29.924	74.5	10 A	53.0	5 A	63.7	61.5	60.8	2
29	29.98	29.82	29.899	77.0	4 P	55.0	4 A	66.0	63.7	57.8	12
30	30.18	29.98	30.093	75.0	3 P	49.0	6 A	62.0	62.5	54.0	15

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	66.3	.776	83.3	S.S.W.	147	3.5	26	2-30 P	2 P	2:15 P	.24	
2	67.3	.816	84.3	N.	81	1.5	17	6 P				
3	57.0	.739	66.0	N.N.E.	99	2.	20	5 P				
4	57.7	.744	67.0	S.S.W.	93	2.	20	6 P				
5	67.2	1.026	69.0	S.W.	199	3.	24	2 P				
6	68.0	1.175	59.3	W.	194	7.5	39	4 P				
7	62.7	.924	73.7	S.E.	125	3.	24	4 P				
8	58.7	.832	72.0	W.	188	5.5	33	3 P				
9	59.0	.675	74.3	W.S.W	68	1.5	17	6 P	3 P	6 P	T	
10	53.3	.630	68.7	N.	67	1.5	17	8 A				
11	51.0	.646	62.0	S.W.	63	2.	20	7 P				
12	60.0	.686	81.3	S.S.W.	190	5.5	33	11 A				
13	66.7	.840	80.0	S.W.	146	2.5	22	5 P				
14	70.3	1.001	78.7	S.	114	1.	14	3 P	1:15 P	4 P	.04	
15	68.3	.725	95.3	S.E.	72	5.	32	2 P	1 P	6 P	1.38	
16	45.7	.544	61.3	N.	194	4.	28	11 A				
17	56.3	.635	74.3	N.	94	3.	24	1 P				
18	58.0	.711	73.0	S.	65	1.	14	8 P				
19	59.0	.702	76.3	N.E.	59	5.	32	4 P				
20	61.3	.777	76.0	S.	101	6.5	36	4 P	3 P	10 P	.44	
21	56.0	.656	69.7	N.W.	173	4.	28	12 P				
22	52.7	.630	66.3	N.	175	5.5	33	7 A				
23	58.0	.694	72.3	S.	265	6.	35	2 P	7:30 P	10 P	T	
24	67.7	.859	81.0	S.S.W.	153	3.	24	4 P	2:30 P	12 P	.72	
25	61.7	.618	90.7	S.W.	84	1.5	17	9 A	0 A	2:30 P	.37	
26	60.0	.708	78.3	N.	59	1.	14	4 P				
27	55.0	.662	70.3	N.W.	68	3.	24	4 P				
28	59.3	.575	89.3	S.W.	117	5.5	33	12 M	11:45 A	12 P	.23	
29	53.0	.632	67.0	N.	174	5.5	33	1 P	0 A	5 A	.71	
30	46.6	.578	58.3	N.	187	6.	35	1-30 P				

*Rain or melted snow at base of tower.

REMARKS.

The weather for the month has been pleasant on a whole. The dry conditions prevailing during April and May continued until the fourteenth of the month. Since that date considerable rain has fallen making the total precipitation for the month slightly above the normal. We have been visited by four severe thunderstorms, that on the fifteenth doing the most damage in this vicinity. The lightning struck in the immediate neighborhood many times. A total of 1.38 inches of rainfall is recorded for the afternoon, one inch of which fell in less than one hour.

The wind movement was slightly above the normal for the month of June; the prevailing direction has been west-southwest. No gales of severity have occured. The percentage of sunshine has been below the usual amount; the mean barometric pressure was very near the normal, the range being small. The relative humidity was 3 per cent higher than the June average.

The first seven days of the month were marked by an unusually high temperature. The maximum (93°) occurred on the fifth and the highest mean daily (81.5°) on the sixth. On the seventh we were swept by a cold wave, the thermometer falling twenty-eight degrees between 2 P. M. and sunset. The remainder of the month has been cool, the nights in particular.

Haying is progressing rapidly, a three-fourths crop is reported on the lowlands. On the hills it is much lighter. Corn is growing slowly on account of the lack of water in the earlier part of the season and the cool nights in the later. Potatoes are in excellent condition, the early fruits are poor and scarce but the later fruits promise well.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 127. JULY, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.94, 1st, 7 A.
Minimum reduced to freezing,	29.35, 9th, 2 P.
Reduced† maximum reading,	30.24, 1st, 7 A.
Reduced† minimum reading,	29.63, 9th, 2 P.
Mean tri-daily reduced,	29.927
Monthly range,	.51

****Air Temperature.*** In Degrees Fahr.

Highest,	90.0, 27th, 2-30 P.
Lowest,	43.0, 1st, 5 A.
Mean hourly,	70.1
Mean of means of max. and min.,	69.8
Mean sensible (wet bulb),	65.7
Monthly range,	47.0
Highest mean daily,	76.7, 6th
Lowest mean daily,	61.3, 20th
Mean maximum,	81.3
Mean minimum,	58.2
Mean daily range,	23.1
Greatest daily range,	37.0, 1st
Least daily range,	11.0, 23d

Humidity.

Mean dew point,	62.5
Mean force of vapor,	.791
Mean relative humidity,	75.2

Precipitation. In inches.

Total precipitation,	4.89
Number of days on which .01 inch or more rain or melted snow fell,	10

Wind.

Total movement,	3891 m.
Greatest daily movement,	240 m., 21st
Least daily movement,	21 m., 15th
Mean daily movement,	125.5 m.
Mean hourly velocity,	5.2
Maximum pressure per square foot,	12 lbs.= 49 m. per hour, on 12th, 7 P., W.
Prevailing Direction,	West Southwest.

Summary.

Southwest,	19 per cent.
South southwest,	26 " "
West,	13 " "
Northwest,	10 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	203 hrs.=44 per cent.
Number of clear days,	9
Number of fair days,	12
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded, . . . 259 hrs.=56%

Rain, 6th, 7th, 8th, 9th, 12th, 16th, 17th, 18th, 25th, 26th, 27th 29th, 30th.

Thunder and Lightning, 6th, 7th, 8th, 12th, 16th, 27th.

Gales, 35 miles or more per hour, 49 m., 12th, W.; 36 m., 21st, S.W.; 45 m., 27th, N. W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.24	30.09	30.152	80.0	3 P	43.0	5 A	61.5	64.8	60.2	15
2	30.09	29.93	30.006	84.0	3 P	55.0	5 A	69.5	70.0	66.7	15
3	30.05	29.96	30.000	89.5	3 P	59.5	5 A	74.0	74.8	70.3	15
4	30.05	29.96	30.011	89.5	3 P	64.0	5 A	76.7	76.3	71.3	13
5	30.02	29.90	29.952	86.5	3 P	62.0	5 A	74.2	73.4	71.5	6
6	29.90	29.78	29.832	89.0	2 P	70.0	4 A	79.5	76.7	73.8	5
7	30.00	29.85	29.934	80.0	3-30 P	63.5	5 A	71.7	71.0	66.5	7
8	30 00	29.72	29.843	74.0	3 P	57.0	5 A	65.5	64.9	65.7	1
9	29.78	29.63	29 672	78.0	1 P	62.0	12 P	70.0	68.6	65.2	4
10	30.04	29.78	29.946	84.5	5-30 P	56.0	4 A	70.2	70.7	63.5	8
11	30.10	30.01	30.074	83.5	3 P	54.5	5 A	69.0	71.6	65.3	13
12	30.07	29.87	29.965	83.0	5 P	57.0	12 P	70.0	69.0	66.5	10
13	29.93	29 83	29 864	78.5	4 P	56.5	4 A	67.5	66.8	62.7	13
14	29.87	29.80	29 840	82.5	5 P	52.5	5 A	67.5	69.8	64.5	11
15	29.97	29.87	29.930	88.0	4-30 P	55.0	5 A	72.5	72.6	66.3	13
16	29.97	29.80	29.861	74.5	4 P	54.0	4 A	64.2	69.5	69.0	0
17	29.79	29.72	29.766	85.5	2 P	70.0	4 A	77.8	75.8	71.7	4
18	29.83	29.72	29.800	80.5	4 P	64.5	5 A	72.5	71.5	63.3	11
19	29.92	29.76	29.814	75.5	3 P	55.0	12 P	65.2	67.5	60.5	10
20	30.04	29 92	30.038	73.5	4 P	47.0	5 A	60.3	61.3	57.5	10
21	30.04	29.80	29.880	87.0	3 P	59.5	3 A	73.3	73.5	68.7	10
22	30.13	29.88	30.003	84.0	3 P	65.0	12 P	74.5	74.2	67.8	9
23	30.16	30.11	30.153	73 0	3 P	62.0	5 A	67.5	67.5	63.3	2
24	30.20	30.14	30.178	78.5	1 P	59.0	5 A	68.8	69.2	62.7	4
25	30.19	29 93	30.080	69.0	12 P	56.5	6 A	62.7	63.2	62.5	0
26	29.93	29.71	29.771	87.0	5 P	65.0	5 A	76.0	74.4	72.3	5
27	29.84	29.66	29.756	90.0	2-30 P	59 5	5 A	74.7	72.8	70.3	9
28	29.99	29.84	29.960	82.5	5 P	56.0	5 A	69 3	69.3	64 2	12
29	30.12	29.82	29.995	76.5	4 P	54.0	5 A	65.2	68.0	64.2	2
30	29.82	29.72	29.776	75.5	4 P	60.0	12 P	67.7	68.7	59.8	10
31	29.96	29.81	29.892	78.5	4 P	50.0	5 A	64.3	66.2	58.7	12

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	55.7	.701	68.0	S.W.	92	1.5	17	2 P				
2	63.7	.822	75.7	S.S.W.	223	4.	28	2 P				
3	66.7	.970	72.0	S.S.W.	164	2.	20	3 P				
4	68.0	.981	73.3	S.S.W.	189	3.	24	3 P				
5	69.0	.931	79.7	S.S.W.	189	4.	28	4 P				
6	71.7	1.004	80.7	S.S.W.	203	5.5	33	2 P	8 P	12 P	T	
7	62.7	.802	73.7	W.	94	2.	20	4 P	0 A	3 A	.18	
8	64.7	.679	90.7	S.W.	50	2.	20	1 P	8 A	12 P	2.03	
9	62.7	.720	80.7	W.	153	4.5	30	5 P	0 A	3:30 P	.09	
10	58.7	.793	65.7	N.	144	3.5	26	2 P				
11	60.3	.822	69.3	S.S.W.	107	4.	28	3 P				
12	64.7	.778	82.0	S.S.W.	227	12.	49	7 P	6:45 P	8:30 P	.63	
13	59.0	.712	73 3	W.	133	3.5	26	10 A				
14	60.3	.800	68.0	N.W.	55	2.	20	1 P				
15	62.0	.868	67.7	N.W.	21	0.5	10	6 P				
16	68.7	.741	93.3	S.	133	1.5	17	1 P	7 A	11 P	.32	
17	68.7	.965	75.3	W.	69	1.5	17	12 M	9:30 P	10 P	T	
18	58.3	.785	63.7	N.N.W.	150	3.0	24	10 A	7 A		T	
19	55.0	.700	62.7	N.W.	173	5.	32	4 P				
20	53.3	.591	71.3	S.W.	79	1.5	17	4 P				
21	66.7	.861	80.3	S.S.W.	240	6.5	36	1 P				
22	64.7	.849	74.3	E.	121	1.5	17	9 P				
23	60.7	.670	80.3	S.	69	0.5	10	2 P				
24	58.7	.720	69.7	E.S.E.	97	1.5	17	11 A				
25	61.3	.601	91.0	N.E.	47	0.	—	—	7 A	12 P	.04	
26	70.0	.922	81.0	S.W.	114	1.	14	1 A	0 A	12 M	.89	
27	67.7	.958	70.0	S.W.	80	10.	45	3 P	3:20 P	5 P	.52	
28	60.7	.742	76.3	N.	55	2.	20	9 A				
29	61.3	.699	79.7	S.W.	107	2.5	22	7 P	11 A	12 P	.02	
30	54.3	.678	65.3	W.N.W.	191	5.	32	1 P	0 A	6 A	.17	
31	58.7	.667	75.7	N.N.W.	122	2.5	22	9 A				

*Rain or melted snow at base of tower.

REMARKS.

The weather for the month has been generally pleasant and the conditions favorable for the growth of crops. Departures from normal conditions have been for the most part small and of an unimportant character. A comparison of some of the elements with the records of the past ten years shows however a few features of interest.

The mean barometer for the month was unusually low and the range exceptionally small; the records showing it to be less than for any month of the period, excepting July, 1895, when the same range (0.51 in.) occurred.

The total wind movement while considerably above the normal, had but few periods when the velocity was especially marked.

The mean temperature for the month was nearly normal: the maximum for the month low.

The precipitation was considerably below the July mean though nearly an inch above the general monthly normal. Nearly all the rainfall occurred in a few well defined storms, and its effect on the weather for the month was comparatively unimportant.

The relative humidity, mean due point and amount of sunshine were all slightly above the mean.

Hay harvesting is practically over and a three-fourths crop is reported, which is considerably better than was expected. Corn, potatoes and tobacco have made good progress during the month and fair yields are expected. Considerable damage was done the tobacco crop at Hatfield by a severe storm on the 12th, the loss being estimated at $50,000. The storm however was not general and other localites were not affected.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 128. AUGUST, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.02, 29th, 9 A.
Minimum reduced to freezing,	29.47, 5th, 2 P.
Reduced† maximum reading,	30.31, 29th, 9 A.
Reduced† minimum reading,	29.75, 5th, 2 P.
Mean tri-daily reduced,	29.977
Monthly range,	.56

****Air Temperature.*** In Degrees Fahr.

Highest,	92.0, 21st, 2-30 P.
Lowest,	41.0, 9th, 5 A.
Mean hourly,	68.0
Mean of means of max. and min.,	68.6
Mean sensible (wet bulb),	63.4
Monthly range,	51.0
Highest mean daily,	76.6, 20th
Lowest mean daily,	57.6, 10th
Mean maximum,	81.1
Mean minimum,	56.0
Mean daily range,	25.1
Greatest daily range,	40.0, 18th
Least daily range,	6.5, 24th

Humidity.

Mean dew point,	59.4
Mean force of vapor,	.750
Mean relative humidity,	74.1

Precipitation. In inches.

Total precipitation,	2.00
Number of days on which .01 inch or more rain or melted snow fell,	4.

Wind.

Total movement,	2522 m.
Greatest daily movement,	178 m., 14th
Least daily movement,	37 m., 1st
Mean daily movement,	81.3 m.
Mean hourly velocity,	3.4
Maximum pressure per square foot,	5.5 lbs.= 33 m. per hour, on 14th, 8 A., N.

Prevailing Direction, South.

Summary.

North,	16 per cent.
East northeast,	10 " "
South,	10 " "
South, southwest,	19 " "
Southwest,	13 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	57 per cent.
Total cloudiness recorded by the Sun Thermometer,	224 hrs.=52 per cent.
Number of clear days,	4
Number of fair days,	12
Number of cloudy days,	15

Bright Sunshine.

Number of hours recorded, 206 hrs.=48%

Rain, 5th, 10th, 21st, 22d, 24th, 25th.

Thunder and Lightning, 21st, 22d.

Gales, 35 miles or more per hour, none.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.05	29.96	30.043	83.5	4 P	52.5	5 A	68.0	67.8	63.0	10
2	30.07	29.89	29.963	83.5	3 P	53.0	6 A	68.2	67.1	65.5	5
3	29.91	29.87	29.893	82.0	3 P	58.5	5 A	70.3	69.8	66.0	5
4	29.91	29.80	29.853	82.5	3 P	59.0	5 A	70.7	70.9	68.8	4
5	29.83	29.75	29.772	86.0	3 P	68.0	5 A	77.0	75.7	69.8	2
6	29.86	29.76	29.800	86.0	1-30 P	66.0	6 A	76.0	73.1	63.3	8
7	29.90	29.82	29.854	77.5	1-30 P	54.0	5 A	65.7	65.9	58.2	10
8	29.98	29.86	29.915	74.5	4 P	44.5	5 A	59.5	61.4	54.7	10
9	30.00	29.92	29.965	78.0	4 P	41.0	5 A	59.5	61.7	56.8	13
10	29.96	29.83	29.896	63.0	2 P	50.0	5 A	56.5	57.6	59.0	0
11	29.93	29.87	29.914	66.5	4 P	57.0	5 A	61.8	61.7	61.0	0
12	29.93	29.79	29.853	79.5	3 P	59.0	5 A	69.2	68.3	66.7	5
13	29.90	29.76	29.807	88.0	3 P	66.5	5 A	77.3	75.1	68.0	10
14	30.14	29.90	30.044	78.0	3 P	51.0	12 P	64.5	65.2	55.0	10
15	30.22	30.14	30.179	78.0	5 P	42.0	5.30 A	60.0	60.9	54.2	11
16	30.18	30.03	30.110	82.0	4 P	43.0	5 A	62.5	63.2	55.5	14
17	30.10	30.03	30.070	85.5	4 P	46.0	5 A	65.7	67.6	59.5	13.5
18	30.10	29.97	30.025	87.0	3 P	47.0	6 A	67.0	70.7	65.7	13.5
19	29.96	29.80	29.865	89.5	2-30 P	69.5	5 A	79.5	76.3	72.5	5
20	29.82	29.75	29.782	90.5	1-30 P	69.0	5 A	79.7	76.6	71.2	4
21	29.89	29.76	29.805	92.0	2-30 P	60.0	6 A	76.0	74.1	68.2	7
22	29.90	29.78	29.850	84.5	1-30 P	63.0	4 A	73.8	70.8	69.0	4
23	29.96	29.88	29.917	81.5	12 M	61.5	6 A	71.5	69.5	66.7	5
24	30.01	29.97	29.985	72.0	3 P	65.5	12 P	68.7	68.3	65.3	1
25	30.03	29.96	29.991	79.0	4 P	63.0	5 A	71.0	69.6	66.8	3
26	30.19	30.02	30.109	82.0	3 P	57.0	12 P	69.5	70.1	64.7	3
27	30.21	30.15	30.189	76.0	1-30 P	51.0	6 A	63.3	63.0	58.5	6
28	30.23	30.17	30.214	80.0	3 P	51.0	6 A	65.5	65.3	58.8	7
29	30.31	30.22	30.262	79.0	1 P	56.0	5 A	67.5	66.4	62.8	3
30	30.29	30.18	30.229	83.0	3 P	53.0	4 A	68.0	65.5	64.2	8
31	30.21	29.99	30.140	85.0	3 P	59.5	4 A	72.2	69.4	66.5	6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	59.7	.733	74.7	W.S.W.	37	0.5	10	4 P				
2	63.7	.768	80.3	S.S.W.	105	4.0	28	4 P				
3	62.7	.771	77.0	N.W.	55	1.0	14	7 P				
4	67.3	.818	83.3	S.S.W.	100	1.5	17	7 P				
5	65.7	.942	70.0	S.W.	102	0.5	10	1 A	11:30A	12 P	T	
6	57.3	.804	61.0	N.	67	1.0	14	1 P				
7	52.7	.651	63.3	N.N.E.	97	1.5	17	3 P				
8	49.3	.568	64.7	N.	104	3.0	24	2 P				
9	51.7	.622	67.0	N.	42	1.0	14	5 P				
10	58.0	.531	90.7	E.S.E.	56	1.0	14	9 P	8:30 A	11 P	1.04	
11	58.7	.592	85.0	N.E.	132	0.5	10	4 P				
12	65.0	.746	86.0	S.W.	80	2.0	20	9 P				
13	61.7	.943	68.0	W.	148	1.5	17	4 P				
14	47.3	.624	57.3	N.N.E.	178	5.5	33	8 A				
15	45.7	.590	60.3	N.	47	0.	—	—				
16	48.3	.661	60.3	S.S.W.	43	0.	—	—				
17	52.7	.779	59.7	S.	49	0.5	10	3 P				
18	61.7	.848	72.0	S.S.W.	85	1.0	14	3 P				
19	70.3	.970	80.0	S.S.W.	65	0.5	10	9 P				
20	69.0	.943	80.7	N.	63	1.0	14	1 P				
21	64.0	.942	70.7	S.	66	2.5	22	5 P	11 P	12 P	.21	
22	67.3	.831	83.3	S.S.W.	75	3.0	24	3 P	3 P	12 P	.68	
23	64.0	.781	80.3	E.	58	0.5	10	5 P				
24	63.3	.700	84.0	E.N.E.	88	0.5	10	10 A	9:45 A	10:15A	.07	
25	64.7	.769	81.3	S.W.	64	0.	—	—	10:30A		T	
26	60.3	.768	73.7	S. E.	88	1.5	17	4 P				
27	54.3	.623	73.3	E. N. E.	77	2.0	20	11 A				
28	53.3	.676	69.0	N. E.	106	2.5	22	12 M				
29	59.7	.694	79.3	E. N. E.	83	0.5	10	9 A				
30	61.7	.746	81.7	S.	51	0.5	10	9 P				
31	63.3	.813	77.7	S. W.	111	2.5	22	3 P				

*Rain or melted snow at base of tower.

REMARKS.

The weather for the month has been generally pleasant, with but few days of excessive heat or high humidity. The sultry weather expected during "dog days" was almost entirely wanting, although the air was unusually quiescent. The total wind movement for the month was only about three-fourths the August mean and not a single gale of 35 or more miles per hour was noted. A large amount of cloudiness was observed although the precipitation was less than one-half the normal.

The mean barometric pressure and range were both slightly below the normal, and the daily fluctuations were generally small.

The mean temperature, relative humidity and dew point were all below the normal, although the departures were small.

Notwithstanding the small rainfall for the month, growing crops have made good progress. Corn is reported to be in excellent condition. Much of the tobacco crop is already harvested and the yield is reported unusually good. Early potatoes are a good crop and the later varieties promise well.

The fruit crop is generally light in this section: the quality however is good.

A good rain is much needed to put the soil in condition for fall ploughing.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

University of Idaho.
Department of [illegible] Arts.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 129. SEPTEMBER, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.16, 16th, 7 A.
Minimum reduced to freezing, 29.28, 12th, 3 P. —26th, 4 P.
Reduced† maximum reading, 30.47, 16th, 7 A.
Reduced† minimum reading, 29.56, 12th, 3P. —26th, 4 P.
Mean tri-daily reduced. 30.022
Monthly range, ...88

****Air Temperature.*** In Degrees Fahr.

Highest, ... 84.0, 1st, 3 P.
Lowest, ... 32.5, 16th, 6 A.
Mean hourly, ... 59.7
Mean of means of max. and min., ... 59.4
Mean sensible (wet bulb), ... 55.4
Monthly range, ... 51.5
Highest mean daily, ... 70.9, 1st
Lowest mean daily, ... 49.0, 14th
Mean maximum, ... 71.1
Mean minimum, ... 47.7
Mean daily range. 23.4
Greatest daily range, ... 38.5, 16th
Least daily range, ... 9.0, 2d

Humidity.

Mean dew point, ... 51.5
Mean force of vapor, ...551
Mean relative humidity, ... 74.0

Precipitation. In inches.

Total precipitation, ... 7.90
Number of days on which .01 inch or more rain or melted snow fell, ... 11.

Wind.

Total movement, ... 3967 m.
Greatest daily movement, ... 256 m., 26th
Least daily movement, ... 45 m., 21st
Mean daily movement, ... 132.2 m.
Mean hourly velocity, ... 5.5 m.
Maximum pressure per square foot, 6.5 lbs.= 36 m. per hour, 29th, 11 A., S.S.W.
Prevailing Direction, Southwest.

Summary.

South, ... 10 per cent.
South, southeast, ... 10 " "
South, southwest, ... 17 " "
Northwest, ... 10 " "
Other directions, ... 53 " "

Weather.

Mean cloudiness observed, ... 47 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 175 hrs.=47 per cent.
Number of clear days, ... 8
Number of fair days, ... 11
Number of cloudy days, ... 11

Bright Sunshine.

Number of hours recorded, . . . 200 hrs.=53%

Rain, 1st, 2d, 3d, 8th, 9th, 12th, 19th, 20th, 21st, 24th, 25th, 26th, 29th, 30th.

Thunder and Lightning, 1st, 3d, 8th.

Frost, on low lands, 14th, 15th. Heavy frost 16th, 28th.

Gales, 35 miles or more per hour, 36m., 29th, S.S.W.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.11	30.01	30.080	84.0	3 P	60.0	4 A	72.0	70.9	68.2	5
2	30.14	30.07	30.104	67.0	3 P	58.0	6 A	62.5	60.2	60.0	0
3	30.07	29.70	29.818	79.0	3 P	58.0	5 A	68.5	66.9	66.0	3
4	30.11	29.73	29.977	72.0	3 P	49.0	12 P	60.5	61.8	53.7	13
5	30.16	29.86	30.005	74.0	3 P	41.5	6 A	57.7	59.7	57.3	7
6	30.14	29.83	29.985	74.0	10 A	57.0	6 A	65.5	64.2	55.5	10
7	30.18	29.99	30.105	72.0	4 P	39.0	5.30 A	55.5	58.2	52.7	9
8	29.99	29.79	29.852	78.0	2 P	57.0	5 A	67.5	68.0	64.5	3
9	30.15	29.85	30.004	74.0	4 P	52.0	12 P	63.0	64.5	56.0	4
10	30.27	30.15	30.235	75.0	3 P	44.5	6 A	59.7	60.1	53.8	12.5
11	30.22	29.79	29.992	64.0	3 P	46.0	5 A	55.0	57.2	55.0	0
12	29.79	29.56	29.633	76.0	4 P	54.0	6 A	65.0	65.0	60.3	9
13	29.95	29 65	29.814	71.0	1 P	45.5	6 A	58 3	58.9	53 8	11
14	30.24	29.95	30.127	60.0	1 P	36.0	6 A	48.0	49.0	44.0	9
15	30.40	30.24	30.311	67.0	4 P	36.5	5 A	51.8	50.3	45.2	9
16	30.47	30.34	30.412	71.0	3 P	32.5	6 A	51.7	53.0	47.3	12
17	30.34	30.15	30.210	78.9	3 P	43.5	6 A	60.7	60.6	56.0	12
18	30.15	30.01	30.069	80.0	4 P	48.0	6 A	64.0	64.8	59.2	9
19	30.04	29.95	29.997	81.0	3 P	60.0	3 A	70 5	68.8	64.5	6
20	29.95	29 71	29.780	72.0	3 P	57.0	12 P	64.5	64.1	62.0	2
21	29.96	29.80	29.864	60.0	7-30 A	48.0	12 P	54.0	55.1	54.0	0
22	30.10	29.96	30.034	72.5	1-30 P	43.0	6 A	57.8	56.6	52.7	7
23	30.32	30.10	30.270	66.5	4 P	42.0	6 A	54.3	53 2	47.0	11
24	30.32	30.10	30.216	62.5	3 P	46.0	1 A	54.2	55.6	52.8	0
25	30.10	29.84	29'952	69.5	11-30 A	55.0	6 A	62.2	62.5	60.7	0
26	29.84	29.56	29.657	74.0	4 P	56.0	12 P	65.0	67.0	65.2	2
27	30.08	29.71	29.952	59.0	5 P	45.0	12 P	52.0	51.7	46.0	6
28	30.20	30.08	30.159	68.5	3 P	38.0	6 A	53.3	54.2	48.8	12
29	30.16	29.81	29.986	73.0	3 P	45.5	6 A	59.2	60.5	55.7	10
30	30.20	29.84	30.047	57.5	1 P	36.0	12 P	46.7	49.8	43.2	6 5

University of Idaho
Department of Liberal Arts

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	66.0	.828	80.7	S. E.	85	2.5	22	12 M	4:45 P	12 P	1.34	
2	58.7	.548	92.0	E.	80	0.5	10	2 P	0 A	10 A	1.76	
3	64.7	.709	89.3	S.	121	5.0	32	7 P	6 P	11 P	1.15	
4	58.0	.553	63.7	N.N.E.	218	5.0	32	12 M				
5	53.7	.575	76.7	S.S.W.	146	4.0	28	2 P				
6	47.7	.623	58.7	N.N.W.	196	5.5	33	1 P				
7	46.7	.536	63.7	W.N.W.	95	5.0	32	8 A				
8	61.3	.726	77.3	W.S.W.	127	1.5	17	4 P	1 A	4 A	.04	
9	49.3	.604	62.3	N.	101	4.0	28	12 M	0 A	6 A	.02	
10	48.0	.565	62.0	S.W.	87	1.5	17	5 P				
11	52.7	.493	81.3	E.	60	0.	—	—				
12	56.3	.651	72.3	N.W.	130	1.5	17	3 P	8 P	9 P	T	
13	50.3	.512	74.3	N.W.	81	3.5	26	11 A				
14	39.7	.363	70.3	N.W.	118	3.5	26	9 A				
15	38.7	.397	67.7	W.N.W.	65	2.0	20	2 P				
16	40.0	.448	64.7	S.S.W.	53	0.	—	—				
17	50.7	.603	66.7	S.S.W.	174	4.0	28	3 P				
18	55.0	.653	73.0	S.S.W.	197	3.0	24	1 P				
19	61.7	.732	78.3	S.S.W.	153	1.5	17	12 M	10 P	12 P	T	
20	60.0	.601	90.0	N.E.	144	5.5	33	12 M	0 A	11 A	1.14	
21	51.7	.453	86.0	N.N.W.	45	1.5	17	6 P	7:30 A	5 P	.49	
22	47.7	.519	69.3	S.W.	115	5.0	32	2 P				
23	40.3	.423	63.0	N.E.	70	0.5	10	10 P				
24	49.7	.462	79.0	S.S.E.	193	4.0	28	4 P	6:30 A	7:15 A	T	
25	59.7	.563	91.3	S.S.E.	180	5.0	32	11 A	9:30 A	9 P	1.72	
26	63.7	.678	87.7	S.S.E.	256	5.5	33	5 P	6 A	5 P	.02	
27	41.3	.379	69.3	W.	133	3.0	24	1 P				
28	41.3	.454	66.0	S.	178	4.0	28	5 P				
29	51.3	.553	73.7	S.	208	6.5	36	11 A	9:30 P	12 P	.20	
30	37.7	.338	69.7	W.	158	5.5	33	11 A	0 A	4 A	.02	

*Rain or melted snow at base of tower.

REMARKS.

The weather for the month was generally pleasant notwithstanding the unusual amount of rain which fell. The drought resulting from the small precipitation during August was effectually broken by copious showers on the first three days of the month which gave a rainfall of over four inches. A period of two weeks followed with scarcely any rain. An unusually clear atmosphere, low humidity and generally cool weather combined to make one of the most pleasant fortnights of the whole year. During the last third of the month the weather was more changeable and a considerable rainfall was again noted. On the 25th during a rainstorm a precipitation of over one and one-half inches was recorded in half an hour.

A comparison of some of the weather elements with the means of the last ten years shows the following characteristics. The mean barometer was slightly below the normal; the range about the usual amount. The mean temperature was about a degree below the normal, the maximum four degrees lower than usual and the minimum about normal making the range smaller than usual. The mean relative humidity and dew-point were both low.

The total wind movement was over 500 miles more than the September average, although but a single gale of more than 35 miles per hour was recorded. About the usual amount of sunshine was observed.

The precipation was more than double the usual amount.

Light frosts were noted on the 14th and 15th and more general ones on the 16th and 28th. Corn and tobacco were generally harvested before the frosts occurred and not much damage was reported.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 130. OCTOBER, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.19, 22d, 8 A.
Minimum reduced to freezing, 29.44, 6th, 9 P.
Reduced† maximum reading, 30.50, 22d, 8 A
Reduced† minimum reading, 29.74, 6th, 9 P.
Mean tri-daily reduced, ... 30.189
Monthly range, ...76

****Air Temperature.*** In Degrees Fahr.

Highest, ... 82.0, 13th, 3 P.
Lowest, ... 20.5, 22d, 6 A.
Mean hourly, ... 51.1
Mean of means of max. and min., ... 51.9
Mean sensible (wet bulb), ... 48.0
Monthly range, ... 61.5
Highest mean daily, ... 67.6, 18th
Lowest mean daily, ... 36.8, 2d
Mean maximum, ... 62.5
Mean minimum, ... 41.4
Mean daily range, ... 21.1
Greatest daily range, ... 40.5, 5th
Least daily range, ... 5.0, 28th

Humidity.

Mean dew point, ... 48.8
Mean force of vapor, ...424
Mean relative humidity, ... 75.9

Precipitation. In inches.

Total precipitation, ... 1.84
Number of days on which .01 inch or more rain or melted snow fell, ... 9.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 2582 m.
Greatest daily movement, ... 227 m., 7th
Least daily movement, ... 5 m., 24th
Mean daily movement, ... 83.3 m.
Mean hourly velocity, ... 3.5 m.
Maximum pressure per square foot, 6.5 lbs.= 36 m. per hour, 21st, 10 A., N.
Prevailing Direction, W. N. W.

Summary.

North, ... 16 per cent.
Northwest, ... 10 " "
North, northeast, ... 16 " "
South, ... 10 " "
Southwest, ... 10 " "
South, southwest, ... 16 " "
Other directions, ... 22 " "

Weather.

Mean cloudiness observed, ... 60 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 201 hrs.=59 per cent.
Number of clear days, ... 3
Number of fair days, ... 14
Number of cloudy days, ... 14

Bright Sunshine.

Number of hours recorded, . . . 140 hrs.=41%

Rain, 6th, 8th, 9th, 17th. 18th. 20th, 23d, 26th, 28th. 29th, 31st.

Gales, 35 miles or more per hour, 36m., 21st, N.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.43	30.20	30.357	50.5	3 P	31.0	6 A	40.7	40.3	35.7	6
2	30.47	30.40	30.451	44.5	3 P	26.0	4 A	35.3	36.8	33.5	2
3	30.45	30.34	30.394	51.0	3 P	25.5	5 A	38.2	37.5	34.0	7
4	30.39	30.14	30.237	66.5	3 P	26.0	6 A	46.3	47.0	43.0	8
5	30.14	30.04	30.094	71.0	4 P	39.0	6 A	55.0	52.9	47.8	6
6	30.04	29.74	29.859	56.0	7 P	40.5	5 A	48.2	49.2	47.8	0
7	30.23	29.78	30.069	60.5	3 P	36.0	12 P	48.3	48.6	42.8	11
8	30.26	30.09	30.181	56.5	3 P	33.0	5 A	44.7	45.4	44.8	3
9	30.09	29.99	30.033	52.5	2 P	46.5	4 A	49.5	49.4	50.0	0
10	30.25	30.07	30.187	74.0	3-30 P	48.0	6 A	61.0	55.7	53.7	10
11	30.29	30.18	30.221	61.5	3 P	49.0	1 A	55.2	54.4	54.3	1
12	30.18	30.09	30.147	78.0	3 P	54.5	6 A	66.3	60.5	58.3	6
13	30.26	30.15	30.214	82.0	3 P	46.0	6 A	64 0	61.0	56.3	9
14	30.22	30.15	30.207	75.5	3 P	53.0	5 A	64.2	61.5	58.5	7
15	30.27	30.17	30.230	78.0	4 P	55.0	5 A	66.5	63.8	61.2	7
16	30.36	30.27	30.302	71.0	3 P	53.0	12 P	62.0	61.3	61.0	4
17	30.27	29.96	30.087	71.0	1-30 P	51.0	6 A	61.0	61.0	59.7	2
18	29.96	29.81	29.859	78.5	3 P	62.0	12 P	70.3	67.6	63.7	4
19	30.15	29.91	30.091	70.0	3 P	48.5	12 P	59.2	58.8	51.0	11
20	30.33	30.09	30.220	54.5	3 P	38.0	12 P	46.2	47.3	41.3	7
21	30.46	30.33	30.409	45.5	3 P	27.0	12 P	36.3	37.9	31.8	4
22	30.50	30.34	30.410	52.0	3 P	20.5	6 A	36.2	39.5	35.8	7
23	30.37	30.28	30.322	48.0	2 P	39.0	5 A	43.5	45.0	44.7	0
24	30.46	30.37	30.452	57.0	4 P	42.0	12 P	49.5	48.5	46.3	1
25	30.45	30.25	30.342	62.5	3 P	39.0	5 A	50.7	49.0	50.8	4
26	30.25	30.08	30.148	68.5	3 P	43.0	1 A	55.8	53.2	54.0	4
27	30.20	30.07	30.134	70.0	1-30 P	43.0	6 A	56.5	53.2	53.0	3
28	30.18	29.90	30.058	53.0	12 P	48.0	6 A	50.5	49.4	49.3	0
29	30 07	29.78	29.876	62.5	11 A	46.0	12 P	54.3	55.2	50.0	0
30	30.24	30.07	30.207	62.0	3 P	36.0	6 A	49.0	48.6	41.8	6
31	30.25	29.77	30.051	52.5	3 P	40.0	2 A	46.2	46.1	42.8	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	28.7	.257	65.7	N.W.	104	4.5	30	2 P				
2	26.0	.228	66.7	N.N.E.	123	5.5	33	1 P				
3	28.7	.234	75.7	N.N.E.	85	3.5	26	12 M				
4	36.3	.384	67.0	S.	63	0.5	10	1 P				
5	42.3	.444	71.7	E.	25	0.	—	—				
6	44.3	.384	77.7	N.	80	5.5	33	7 P	9 A	2 P	.02	
7	32.3	.367	57.3	N.N.E.	227	5.0	32	2 P				
8	41.0	.350	77.7	N.E.	65	0.5	10	7 P	10 P	12 P	T	
9	49.0	.372	94.7	N.	117	0.	—	—	0 A	9 P	.18	
10	50.3	.519	79.0	S.	9	0.	—	—				
11	53.0	.449	91.7	S.W.	9	0.5	10	10 P				
12	55.0	.587	83.3	W.	7	0.	—	—				
13	53.3	.583	79.7	S.S.E.	39	2.5	22	7 P				
14	56.0	.592	80.3	S.S.W.	154	3.	24	4 P				
15	58.0	.659	78.3	S.W.	45	0.	—	—				
16	58.7	.666	84.3	S.S.E.	95	2.0	20	12 M				
17	56.7	.590	82.0	S.	80	1.0	14	12 P	8 P	12 P	T	
18	59.3	.724	73.0	N.W.	111	3.5	26	6 A	0 A	9 A	.73	
19	43.3	.515	59.0	N.W.	106	2.5	22	12 M				
20	34.0	.322	63.3	N.	171	5.5	33	1 P	5 A	9:30 A	.13	
21	21.3	.227	54.7	N.	207	6.5	36	10 A				
22	26.3	.278	58.3	S.S.W.	39	0.5	10	3 P				
23	43.3	.311	90.0	S.S.W.	68	1.0	14	6 A	2 A	3 P	.17	
24	43.3	.353	82.0	N.	5	0.	—	—				
25	48.0	.412	70.3	S.S.W.	66	0.	—	—				
26	52.0	.470	89.0	S.S.W.	14	0.	—	—	2 A	9 A	.02	
27	47.3	.434	82.7	E.S.E.	73	1.5	17	5 P				
28	48.7	.358	93.3	N.N.W.	18	3.0	24	7-30 A	1 P	12 P	.04	
29	54.3	.456	84.3	W.	160	3.5	26	6 A	0 A	3 P	.22	
30	34.7	.363	62.0	N.N.E.	47	0.5	10	6 P				
31	39.3	.312	79.7	N.N.E.	189	3.5	26	4 P	9:30 P	12 P	.33	

*Rain or melted snow at base of tower.

REMARKS.

The weather for October presents a record that is more or less interesting in several respects, owing to considerable departures from normal conditions of a number of the weather elements. Altogether they gave a month generally pleasant for the time of year.

The most marked departures from normal conditions were in atmospheric pressure and movement. The mean barometer was unusually high. The changes were generally slow and small, giving for the month a range of only about two-thirds the usual amount. The total wind movement was correspondingly small, being less than two-thirds the October mean. An examination of the daily movement on the previous page shows quiescent periods of considerable duration. But one gale was recorded for the month, and that of only 36 miles per hour.

The mean temperature was over two degrees above the normal; the range large; the maximum rather high and the minimum over three degrees lower than the mean October minimum. A warm period, extending from the 10th to the 19th, caused the high monthly mean. The mean dew point was nearly eight degrees above the normal.

The relative humidity was high, and the amount of sunshine less than usual. About one-half the usual precipitation was recorded, nearly all of it in the last half the month. From April 1st the deficiency in precipitation is over four inches. Good rains are needed before the ground becomes frozen.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 131. NOVEMBER, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.23, 17th, 9 A.
Minimum reduced to freezing, 29.14, 1st, 2 P.
Reduced† maximum reading, 30.54, 17th, 9 A.
Reduced† minimum reading, 29.44, 1st, 2 P.
Mean tri-daily reduced, ... 30.006
Monthly range, ... 1.10

****Air Temperature.*** In Degrees Fahr.

Highest, ... 58.0, 7th, 3 P.
Lowest, ... 17.5, 14th, 7.30 A.
Mean hourly, ... 37.0
Mean of means of max. and min., ... 37.3
Mean sensible (wet bulb), ... 34.8
Monthly range, ... 40.5
Highest mean daily, ... 46.7, 1st
Lowest mean daily, ... 29.7, 14th
Mean maximum, ... 46.3
Mean minimum, ... 28.3
Mean daily range, ... 18.0
Greatest daily range, ... 35.0, 7th
Least daily range, ... 4.5, 15th

Humidity.

Mean dew point, ... 29.8
Mean force of vapor, ...235
Mean relative humidity, ... 76.2

Precipitation. In inches.

Total precipitation, ... 2.17
Number of days on which .01 inch or more rain or melted snow fell, ... 8.0
Snow total in inches, ... 0.5

Wind.

Total movement, ... 3361 m
Greatest daily movement, ... 295 m., 12th
Least daily movement, ... 10 m., 15th
Mean daily movement, ... 112.0 m.
Mean hourly velocity, ... 4.7 m.
Maximum pressure per square foot, 11.lbs.= 47 m. per hour, 12th, 11 A., W.N.W.
Prevailing Direction, Northwest.

Summary.

North, ... 30 per cent.
Northwest, ... 17 " "
North, northeast, ... 10 " "
West, ... 13 " "
South, ... 10 " "
South, southwest, ... 10 " "
Other directions, ... 10 " "

Weather.

Mean cloudiness observed, ... 53 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 163 hrs.=56 per cent.
Number of clear days, ... 8
Number of fair days, ... 9
Number of cloudy days, ... 13

Bright Sunshine.

Number of hours recorded, . . . 130 hrs.=44%
Rain, 1st, 3d, 4th, 11th, 12th, 14th, 15th, 19th, 22d.
Snow, ... 12th, 14th, 15th.
Hail, ... 11th.
Gales, 35 miles or more per hour, 35m., 1st, N.; 35m., 2d, N.; 44m., 10th, W.; 47 m., 12th, W.N.W.; 37m., 16th, N.N.E.; 39m., 20th, N.; 35m., 23d, N.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible, Wet Bulb.	
1	29.77	29.44	29 564	52.0	3 P	42.0	7 A	47.0	46.7	45.3	0
2	30.34	29.73	30.163	45.0	1 P	32.0	12 P	38.5	39.3	32.3	8
3	30.42	30.09	30.327	50.5	1 P	24.0	6 A	37.3	38.8	35.7	6
4	30.09	29.86	29.892	50.0	1-30 P	38.0	6 A	44.0	42.9	40.2	2
5	30.07	29.94	30.012	52.0	2-30 P	32.0	7-30 A	42.0	41.0	37.5	5
6	30.34	30.07	30.237	50.0	3 P	31.5	6 A	40.7	39.5	35.8	6
7	30.40	30.30	30.350	58.0	3 P	23.0	6 A	40.5	38.2	34.7	10
8	30.37	30.14	30.263	57.0	3 P	25.0	6 A	41.0	39.1	38.3	9
9	30.14	29.83	29.929	57.0	3 P	27.0	8 A	42.0	40.5	38.8	9
10	29.90	29.74	29.791	55.0	11 A	34.5	5 A	44.8	44.8	40.0	2
11	29.98	29.80	29.879	43.0	0 A	33.0	12 P	38.0	36.0	35.2	0
12	30.21	29.80	30.039	35.0	3 P	25.0	12 P	30.0	31.1	28.5	5
13	30.31	30.21	30.271	41.5	3 P	18.5	7-30 A	30.0	30.1	27.3	10
14	30.37	30.24	30.302	37.0	2 P	17.5	7-30 A	27 3	29.7	28.2	5
15	30.24	29.95	30.049	33.5	12 P	29.0	6 A	31.2	31.7	32.3	0
16	30.41	29.96	30.229	47.5	3 P	31.5	3 A	39.5	39.5	36.3	9
17	30.54	30.40	30.467	45.0	2 P	21.0	6-30 A	33.0	32.2	29.3	9
18	30.40	30.02	30.156	42.5	2-30 P	24.0	6 A	33.3	34.3	35.2	0
19	30.02	29.72	29.804	49.5	3 P	33.0	5 A	41.2	40.3	41.3	1
20	29.95	29.72	29.880	48.5	1 P	36.0	12 P	42.3	41.7	36.7	5
21	29.98	29.90	29.943	47.0	1-30 P	31.5	12 P	39.2	36.6	32.3	6
22	29.90	29.70	29.757	40.0	1 P	28.0	5 A	34.0	35.1	34.5	0
23	29.98	29 72	29.868	47.5	2 P	32.0	6 A	39.7	38.9	34.8	8
24	30.07	29.98	30.038	49.0	3 P	29.0	12 P	39.0	38.7	34.5	8
25	30.02	29.90	29.954	37.0	2 P	22.0	6 A	29.5	29.8	28.8	0
26	30.00	29.89	29.931	48.5	3 P	22.0	2 A	35.2	34.9	33.3	6
27	29.92	29.86	29.886	38.0	3 P	26.0	4 A	32.0	33.6	32.7	0
28	29.87	29 66	29.745	42.5	3 P	30.0	12 P	36.3	37.0	35.3	0
29	29.73	29.65	29.687	45.0	3 P	21.5	6 A	33.2	33.4	33.3	0
30	29.85	29.72	29.770	46.0	3 P	29.0	5 A	37.5	34.9	34.5	1

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	44.0	.317	92.7	N.	177	6.0	35	10 P	0 A	7:30 P	.44	
2	22.7	.226	57.0	N.	277	6.0	35	2 P				
3	29.7	.252	69.7	E.N.E.	92	1.0	14	2 P	5 P	12 P	.40	
4	34.7	.292	70.7	W.	193	4.0	28	12 M	0 A	7 A	.31	
5	33.3	.261	76.3	N.W.	136	1.5	17	2 P				
6	29.7	.252	69.7	N.W.	145	3.5	26	11 A				
7	29.0	.262	74.7	N.W.	13	0.	—	—				
8	34.0	.283	75.7	S.	18	0.	—	—				
9	34.3	.291	77.3	S.	37	0.5	10	4 P				
10	34.3	.294	69.3	W.	180	9.5	44	1 P				
11	33.3	.211	92.3	N.	55	1.5	17	9 A	9 A	12 P	.78	
12	23.3	.172	75.3	N.W.	295	11.0	47	11 A	0 A	4 A	.02	T
13	18.7	.182	66.3	N.N.W.	124	1.0	14	2 P				
14	24.7	.170	84.3	W.	11	0.	—	—	6:30 P	12 P	* *	0.5
15	30.7	.186	95.0	N.W.	10	0.	—	—	0 A	10 P	.18	T
16	28.7	.256	65.3	N.	223	7.0	37	8 A				
17	23.7	.192	73.3	W.	97	0.	—	—				
18	32.0	.224	84.3	S.W.	43	1.0	14	1 P				
19	40.7	.269	95.0	N.	28	0.5	10	10 P	10:30 A	12 M	T	
20	28.3	.261	62.3	N.	265	7.5	39	11 A				
21	24.7	.218	65.3	N.	211	4.0	28	9 A				
22	32.0	.212	86.3	S.	24	0.5	10	9 P	4 A	10 P	.04	
23	27.0	.248	61.7	N.N.E.	215	6.0	35	10 A				
24	27.0	.247	62.7	N.N.E.	217	2.0	20	1 P				
25	26.0	.171	85.3	N.	66	2.0	20	4 P				
26	25.7	.231	65.7	N.	48	1.0	14	10 A				
27	29.0	.204	78.7	S.S.W.	33	0.	—	—				
28	32.3	.225	81.3	S.S.W.	89	1.0	14	3 P				
29	29.3	.210	86.0	S.S.W.	22	0.	—	—				
30	31.3	.220	85.3	N.N.E.	17	0.	—	—				

*Rain or melted snow at base of tower.

REMARKS.

The weather for the month was average November weather and presented but few departures from normal conditions of more than passing interest. Changes of temperature and barometric pressure were generally slow and well within usual limits.

A comparison of the records with the mean November conditions of the past ten years gives the following departures from the normal.

The mean barometer was somewhat less than usual with a low maximum and small range. The wind movement was about a thousand miles less than normal, due to a considerable number of comparatively calm days. About the usual number of gales was noted, though there was none of any marked severity.

The mean temperature was over a degree below the normal; the maximum about seven degrees lower than usual; the minimum about the same amount higher, giving a range of less than three-fourths the normal range. The minimum is the highest November minimum on our records here.

The relative humidity was slightly high; the mean dew-point rather low.

The precipitation was nearly two inches less than normal and taken with the small October precipitation gives a large deficiency for the two months. The total deficiency for the year to December 1st is only about three inches.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 132. DECEMBER, 1899.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.36, 17th, 7 A.
Minimum reduced to freezing,	28.79, 24th, 8 P.
Reduced† maximum reading,	30.68, 17th, 7 A.
Reduced† minimum reading,	29.10, 24th, 8 P.
Mean tri-daily reduced,	30.032
Monthly range,	1.58

****Air Temperature.*** In Degrees Fahr.

Highest,	61.0, 12th, 10 A.
Lowest,	2.0, 31st, 7 A.
Mean hourly,	30.8
Mean of means of max. and min.,	31.0
Mean sensible (wet bulb),	29.2
Monthly range,	59.0
Highest mean daily,	54.7, 12th
Lowest mean daily,	8.3, 30th
Mean maximum,	38.5
Mean minimum,	23.5
Mean daily range,	15.0
Greatest daily range,	27.0, 1st
Least daily range,	4.5, 5th

Humidity.

Mean dew point,	25.1
Mean force of vapor,	.194
Mean relative humidity,	79.4

Precipitation. In inches.

Total precipitation,	2.00
Number of days on which .01 inch or more rain or melted snow fell,	8.0
Snow total in inches,	0.5
Snow on ground at end of month,	0

Wind.

Total movement,	4142 m
Greatest daily movement,	371 m., 12th
Least daily movement,	4 m., 18th
Mean daily movement,	133.3 m.
Mean hourly velocity,	5.6 m.

Maximum pressure per square foot, 15.5 lbs.= 56 m. per hour, 12th, 1 P., S.W.

Prevailing Direction, West.

Summary.

North,	13 per cent.
Northwest,	13 " "
North, northwest,	10 " "
West,	16 " "
South,	10 " "
Southwest,	19 " "
Other directions,	19 " "

Weather.

Mean cloudiness observed,	52 per cent.
Total cloudiness recorded by the Sun Thermometer,	141 hrs.=50 per cent.
Number of clear days,	9
Number of fair days,	12
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded,	142 hrs.=50%

Rain. 1st, 2d, 3d, 4th, 11th, 12th, 15th, 19th, 24th.

Snow, 5th, 8th, 17th, 24th.

Hail, 12th.

Gales, 35 miles or more per hour, 40m., 4th, N.W.; 40m., 5th, W.N.W.; 40m., 8th, N.W.; 35m., 18th, S.W.; 56m., 12th, S.W.; 46 m., 15th, N.W.; 36m., 19th, S.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.91	29.53	29.744	55.0	9 P	28.0	4 A	41.5	41.5	42.2	2
2	29.64	29.51	29.582	51.0	3 P	41.5	7:30 A	46.3	44.5	38.7	6
3	29.74	29.60	29.680	49.5	2 P	31.0	8 A	40.2	40.4	38.0	4
4	29.67	29.28	29 486	42.0	2:30 P	31.0	9 P	36 5	36.4	33.8	3
5	30.02	29.67	29.933	31.5	3 P	27.0	8 P	29.3	29.5	26.0	5
6	30.36	29.93	30.083	33.0	3 P	24.0	12 P	28 5	29.0	25.3	4
7	30.54	30.10	30.385	35.0	3 P	15.5	7:30 A	25.3	26 5	24.5	8
8	30.10	29.97	30.015	40.5	3 P	27.5	3 A	34.0	34.1	31.8	4
9	30.46	30.09	30.368	30.0	3 P	17.0	12 P	23.5	24.3	19.8	9
10	30.51	30.30	30.411	36.0	12 P	12.0	5 A	24.0	23.8	24.7	0
11	30.30	30.04	30.180	54.0	12 P	36.0	0 A	45.0	44.9	45.3	0
12	30.04	29.60	29.786	61.0	10 A	46.0	12 P	53.5	54.7	53.2	0
13	30.13	29 83	29 943	54.0	3 P	35.0	7:30 A	44 5	42.6	38.2	5
14	30.34	30.13	30.262	37.0	12 M	29.5	7:30 A	33 3	33.4	29.0	5
15	30.32	29.83	30.060	36.0	0 A	25.0	12 P	30.5	30.8	28.3	4
16	30.66	30.32	30.583	35.0	3 P	16.0	12 P	25.5	24.5	21.2	9
17	30.68	30.53	30.599	29 5	2 P	13.0	6 A	21.2	22.5	24.0	0
18	30.53	30.39	30.471	33.9	3 P	27.5	5 A	30.2	30.5	31.3	0
19	30.39	29.93	30.094	51.5	3 P	32.0	4 A	41.7	41.1	42.3	1
20	30.37	30.20	30.336	43.0	1 P	29.5	2 A	36.2	34.5	31.7	6
21	30.38	30.25	30.309	46.0	3 P	26.0	9 A	36.0	34.1	32.0	9
22	30.37	30.30	30.348	34.5	9 P	22 5	6 A	28.5	30.1	31.7	0
23	30.34	29 97	30.160	45 0	3 P	31.5	6 A	38.3	36 7	36.5	4
24	29.97	29.10	29.403	42.0	9:30 P	32.0	6 A	37.0	35.6	36.2	0
25	29.64	29.13	29.461	36.0	0 A	21.0	12 P	28.5	29.8	28.5	4
26	29.91	29.64	29.802	28.0	3 P	14.5	8:30 A	21.2	20.2	19.0	9
27	30.12	29.91	30.096	30.0	3 P	12.0	7:30 A	21.0	21.5	19.8	9
28	30.15	29 97	30.068	31.5	3 P	12.0	6 A	21.7	19.8	19.8	7
29	29 97	29.71	29.804	27.5	2:30 P	6.0	7:30 A	16.8	16.5	15.0	8
30	29.77	29.64	29.706	14 0	2:30 P	5.0	8 A	9.5	8 3	6.8	9
31	29.87	29.77	29.842	20.0	2 P	2.0	7 A	11.0	12.0	10.0	8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	39.7	.311	84.3	S.W.	76	4.5	30	11 P	11 P	12 P	T	
2	32.0	.284	66.0	N.W.	166	4.0	28	9 A	0 A	6 A	.28	
3	35.0	.257	83.7	S.W.	74	.0	—	—	5 P	12 P	T	
4	28.3	.219	74.3	N.W.	164	8.0	40	12 M	0 A	9 A	.22	
5	20.0	.156	72.7	W.	239	8.0	40	10:30 A	11 A			T
6	19.7	.154	71.3	W.	135	4.5	30	0 A				
7	20.3	.148	78.7	W.S.W.	109	4.5	30	8 P				
8	26.0	.203	73.7	W.S.W.	231	8.0	40	12 M	2 A	5 A		T
9	12.7	.123	67.7	N.	265	4.5	30	2 A				
10	22.3	.144	88.0	S.	66	1.0	14	10 P				
11	43.3	.354	88.0	S.	169	6.0	35	7 P	7 A	12 M	.04	
12	51.7	.428	90.3	S.W.	371	15.5	56	1 P	9 A	2 P	.43	
13	32.7	.277	73.0	W.	181	5.5	33	1 P				
14	20.7	.188	61.0	N.N.W.	114	2.5	22	0 A				
15	22.3	.172	74.0	N.N.W.	185	10.5	46	3 P	1 A	9:30 A	.44	
16	13.0	.135	63.7	N.	95	3.5	26	0 A				
17	21.3	.139	89.0	N.N.W.	7	1.0	14	6 P	10 A	9 P	.08	0.5
18	30.0	.178	96.7	S.S.W.	4	0.0	—	—				
19	40.7	.290	89.3	W.	216	6.5	36	11 A	12 M	4 P	.11	
20	26.7	.201	72.7	W.	125	2.0	20	0 A				
21	27.3	.214	70.7	S.	77	1.0	14	2 P				
22	30.3	.182	95.0	N.	41	0.	—	—				
23	33.3	.234	85.3	S.W.	36	1.0	14	7 P				
24	34.0	.224	89.0	E.S.E.	200	4.5	30	1 P	11 A	9 P	.40	T
25	33.0	.199	89.0	W.	153	3.0	24	1 P				
26	15.7	.112	83.7	N.W.	93	3.0	24	3 P				
27	16.7	.118	83.7	S.W.	89	1.5	17	10 A				
28	17.7	.116	88.7	N.E.	35	0 5	10	2 P				
29	11.7	.109	81.7	N.	91	4.0	28	12 P				
30	1.0	.066	73.3	N.W.	229	3.0	24	6 P				
31	-0.3	.083	61.7	S.S.W.	106	2.5	22	11 A				

*Rain or melted snow at base of tower.

Annual Summary for 1899.

Pressure. In inches.

Maximum reduced to freezing, ... 30.57 Jan. 2, 9 A.
Minimum reduced to freeezing, ... 28.79, Dec. 24, 8 P.
Maximum reduced to freezing and sea-level, ... 30.92, Jan. 2, 9 A.
Minimum reduced to freezing and sea-level, ... 29.10, Dec. 24, 8 P.
Mean reduced to freezing and sea-level, ... 30.011
Annual range, ... 1.82

****Air Temperature.*** In degrees Fahr.

Highest, ... 93.0, June 5th, 3 P.
Lowest, ... -21.5, Jan. 2d, 6 A.
Mean, ... 40.8
Mean of means of max. and min., ... 47.2
Mean sensible (wet bulb). 43.7
Annual range. 114.5
Highest mean daily. . . . . 81.5, June 6th
Lowest mean daily, ... -0.5, Feb. 11th
Mean maximum, ... 57.8
Mean minimum, ... 36.6
Mean daily range, ... 21.2
Greatest daily range, ... 47.0, April 29
Least daily range, 4.5, Mar. 15th, Nov. 15th. Dec. 5th.

Humidity.

Mean dew point. 40.1
Mean force of vapor, ...420
Mean relative humidity, ... 75.6

Wind.

Prevailing direction, ... West, south west

Summary.

North. . . . . 18 per cent.
North west. . . . . 15 "
South south west. . . . . 12 "
South west, ... 11 "
South. . . . . 10 "
West . . . . . 10 "
Other directions. . . . . 24 "
Total movement, ... 47110. m.
Greatest daily movement. . . . . 449. Feb. 13th
Least daily movement, ... 4. Dec. 18th
Mean daily movement, ... 129.
Mean hourly velocity, ... 5.2

Maximum pressure per square foot, 22 lbs.=66 m. per hour, Mar. 7th, 12 M.; N. E.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 41.49
Number of days on which .01 or more rain or melted snow fell. 110
Snow total in inches, ... 52

Weather.

Mean cloudiness observed, ... 54 per cent
Total cloudiness recorded by Sun Thermometer, ... 2210 hrs.=50 per cent
Number of clear days. 81
Number of fair days, ... 139
No. of cloudy days. 135

Bright Sunshine.

Number of hours recorded. 2245 hrs.=50 per cent

Dates of Frosts.

Last. . . . . May 4th
First. . . . . Sept. 14th

Dates of Snow.

Last, ... April 16th
First. . . . . Nov. 12th
Total days of sleighing, ... 51

Gales of 50 or More Miles Per Hour.

Jan. 52 m., 7th, N. W; 60 m. 15th, N. W.; 64 m. 27th, N. W.
Feb. 51 m., 10th, W; 55 m., 13th, N.
Mar. 66 m., 7th, N. E; 62 m., 20th, N.; 61 m., 29th, N. W.; 53 m., 30th, W.
Dec. 56 m., 12th, S. W.

* Temperature in ground shelter.

J. E. OSTRANDER, Meteorologist.

A. A. MONAHAN, Observer.

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METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 133. JANUARY, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.35, 17th, 9 P.
Minimum reduced to freezing, 28.77, 20th, 12 P.
Reduced† maximum reading, 30.67, 17th, 9 P.
Reduced† minimum reading, 29.08, 20th, 12 P.
Mean tri-daily reduced, ... 30.034
Monthly range, ... 1.58

****Air Temperature.*** In Degrees Fahr.

Highest, ... 51.5, 23d, 2:30 P.
Lowest, ... -4.5, 4th, 7:30 A.
Mean hourly, ... 25.5
Mean of means of max. and min., ... 24.8
Mean sensible (wet bulb), ... 23.8
Monthly range, ... 56.0
Highest mean daily, ... 40.2, 23d
Lowest mean daily, ... 11.7, 3d
Mean maximum, ... 34.5
Mean minimum, ... 15.2
Mean daily range, ... 19.3
Greatest daily range, ... 34.0, 4th
Least daily range, ... 8.0, 1st

Humidity.

Mean dew point, ... 18.1
Mean force of vapor, ...152
Mean relative humidity, ... 75.1

Precipitation. In inches.

Total precipitation, ... 4.08
Number of days on which .01 inch or more rain or melted snow fell, ... 15.0
Snow total in inches, ... 12.5
Snow on ground at end of month, . . 4 inches

Wind.

Total movement, ... 4904 m.
Greatest daily movement, ... 360 m., 27th
Least daily movement, ... 15 m., 15th
Mean daily movement, ... 158.0 m.
Mean hourly velocity, ... 6.6 m.
Maximum pressure per square foot, 20.5 lbs.= 64 m. per hour, 26th, 4:30 P., N.W.
Prevailing Direction, West.

Summary.

North, ... 16 per cent.
Northwest, ... 19 " "
Northeast, ... 10 " "
West, ... 13 " "
South, ... 19 " "
Southwest, ... 13 " "
Other directions, ... 10 " "

Weather.

Mean cloudiness observed, ... 52 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 127 hrs.=43 per cent.
Number of clear days, ... 12
Number of fair days, ... 10
Number of cloudy days, ... 9

Bright Sunshine.

Number of hours recorded, . . . 167 hrs.=57%
Rain, 7th, 10th, 11th, 12th, 14th, 16th, 19th, 20th, 21st, 25th, 26th.
Snow, 1st, 11th, 12th, 14th, 18th, 28th, 29th, 31st.
Sleet, ... 11th.
Gales, 35 miles or more per hour. 37m., 5th, S.W.; 48m., 8th, N.W.; 35m., 9th, S.W.; 39m., 10th, S.W.; 35m., 11th, N.N.E.; 46 m., 21st, N.; 36m., 23d, N.W.; 64m., 26th, N.W.; 55m., 27th, N.W.; 39m., 29th, N.W.
No. days sleighing, ... 11

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.82	29.40	29.523	19.0	2:30 P	11.0	8 A	15.0	14.5	15.0	1
2	29.77	29.50	29.626	27.5	2:30 P	6.0	7:30 A	16.7	18.5	16.3	7
3	30.34	29.77	30.121	19.0	1 P	4.0	7:30 A	11.5	11.7	10.1	8
4	30.53	30.34	30.491	29.5	3 P	−4.5	7:30 A	12.5	13.0	11.5	8
5	30.45	30.20	30.266	39.5	3 P	15.0	0 A	27.3	31.9	30.2	4
6	30.48	30.25	30.383	40.0	1 P	20.0	12 P	30.0	34.2	29.8	6
7	30.47	29.85	30.166	40.0	3 P	11.0	6:30 A	25.5	29.3	28.8	9
8	30.47	29.84	30.156	41.5	5 A	16.0	12 P	28.8	31.2	25.2	8
9	30.55	30.12	30.398	26.0	3 P	6.0	7:30 A	16.0	17.0	14.7	8
10	30.12	29.83	29.937	41.0	3 P	20.0	0 A	30.5	30.3	30.7	0
11	30.32	29 72	30.163	26.0	3 P	10.0	7:30 A	18.0	19.7	17.8	6
12	29.85	29.49	29.640	37.0	3 P	22.0	0 A	29.5	30.2	29.5	2
13	30.14	29 85	30.068	34.0	4:30 P	15.0	7:30 A	24.5	24.7	21.0	9
14	30.04	29.92	30.005	31.5	2 P	11.0	7:30 A	21.2	23.5	23.8	3
15	30.32	30.04	30.277	42.0	4 P	24.0	9 A	33.0	29.7	29.2	6
16	30.27	29.97	30.089	44.0	3 P	26.0	0 A	35.0	35.0	34.5	3
17	30.67	30.24	30.553	35.0	1 A	22.0	12 P	28.5	29.3	25.3	8
18	30.64	30.25	30.431	31.5	3 P	20.5	6 A	26.0	26.1	27.0	0
19	30.25	29.93	30.022	45.0	2 P	29.0	6 A	37.0	35.6	38.3	4
20	29.93	29.08	29.373	42.5	9 P	34.0	6 A	38.3	36.8	38.8	0
21	30.13	29.08	29.849	41.0	0 A	19.0	12 P	30.0	26.7	21.7	8
22	30.17	30.04	30.122	50.5	3 P	18.0	3 A	34.2	33.9	31.0	9.5
23	30.04	29 71	29.840	51 5	2:30 P	32.0	6 A	41.8	40.2	36.2	6
24	30.34	30.01	30.293	26.5	4 P	11.0	7 A	18.7	21.2	16.1	8
25	30.16	29.33	29.688	32.0	9 P	20.0	5 A	26.0	26.4	27.8	0
26	29.61	29.26	29.447	26.0	4 A	9.0	12 P	17.5	18.1	13.2	4
27	30.26	29.61	30.075	24.0	3 P	8.0	6 A	16.0	17.3	14.8	9
28	30.29	29 82	30.106	38.5	3 P	11.0	6:30 A	24.8	26.4	25 7	7
29	29.82	29.46	29.577	32.0	4 A	12.0	9 P	22.0	23.8	20.0	6
30	29.94	29.72	29.842	25.0	3 P	4.0	7:30 A	14.5	15.8	14.2	8
31	29.72	29.41	29.525	32.0	3 P	8.0	12 P	20.0	17.8	18.6	2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	11.0	.093	82.7	N.W.	151	4.0	28	9 P	4 A	4 P	.30	5.0
2	9.0	.109	66.7	S.W.	199	4.5	30	5 P				
3	4.3	.077	74.3	W.	121	3.0	24	1 P				
4	6.7	.091	73.7	S.	58	0.5	10	4 P				
5	22.7	.198	64.3	S.W.	208	7.0	37	4 A				
6	21.0	.201	59.7	N.W.	200	4.0	28	9 A				
7	25.7	.183	85.0	S.	223	5.5	33	1 P	6:30 P	12 P	.03	
8	14.7	.169	58.3	N.W.	297	11.5	48	11:30 A				
9	7.0	.110	70.0	W.	115	6.0	35	9 P				
10	27.0	.185	81.0	S.	282	7.5	39	4 A	5 A	12 M	.03	
11	13.7	.108	80.0	N.N.E.	175	6.0	35	8 A	6:30 P	12 P	.60	1.0
12	24.7	.181	75.7	N.N.E.	144	3.0	24	9 P	0 A	6 A	.50	1.0
13	12.7	.132	66.3	N.	115	1.5	17	10 A				
14	21.0	.141	88.3	S.	33	0.5	10	2 P	1:30 P	8 P	.15	1.5
15	24.0	.182	75.7	N.E.	15	0.0	—	—				
16	30.7	.223	79.7	S.W.	97	2.0	20	9 A	4 A	11 A	.18	
17	17.0	.160	61.3	N.E.	171	4.5	30	10 A				
18	24.3	.154	88.0	N.	22	0.0	—	—	3:30 P	12 P	T	T
19	37.7	.239	96.3	S.	22	1.0	14	12 M	0 A	9 A	.12	
20	38.3	.240	100.0	S.W.	26	4.5	30	12 P	5 A	12 P	.80	
21	12.0	.138	57.3	N.	291	10.5	46	5 A	0 A	5 A	.38	
22	23.3	.220	64.0	S.	99	1.0	14	9 P				
23	29.3	.263	65.7	W.	230	6.5	36	5 P				
24	7.0	.105	64.0	N.E.	250	5.5	33	7 A				
25	27.7	.153	100.0	N.	69	1.0	14	8 P	6 A	12 P	.11	
26	7.3	.096	68.7	N.W.	311	20.5	64	4.30 P	0 A	3 A	.07	
27	3.0	.101	53.7	N.W.	360	15.0	55	1 P				
28	21.0	.130	79.0	S.S.W.	111	5.0	32	1 P	5 P	12 P	.43	2.0
29	15.7	.120	79.0	N.W.	275	7.5	39	4 P	0 A	10 A	.32	1.0
30	6.7	.099	69.7	S.S.W.	184	3.5	26	3 P				
31	16.3	.112	90.0	W.	50	5.0	32	9:30 P	6 A	5 P	.06	1.0

*Rain or melted snow at base of tower.

REMARKS.

The weather for the month was hardly as severe as is usual at this season of the year and disagreeable features were not prominent. Extremes of temperature and severe storms were noticeably absent although a few short periods of low temperature were recorded.

A comparison of some of the weather elements with the normals here shows a few features of interest. The mean barometric pressure was unusually high although the maximum and minimum were about normal. Fluctuations in pressure were marked and rather large at times, the barometer being generally unsteady during the whole month. The total wind movement was considerably above the January mean, due to three well defined periods of heavy winds.

The mean temperature was about two degrees above the normal, with about the usual range. The relative humidity was about two per cent lower than usual. The percentage of sunshine recorded was high although the cloudiness observed was about normal.

The precipitation was about half an inch more than the normal amount; more falling as rain than as snow. A few days sleighing occurred near the middle of the month. It soon disappeared with warmer weather, leaving the ground bare until the snowfall of the 29th, which made excellent sleighing. This was still in good condition when the month closed.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 134. FEBRUARY, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.42, 28th, 7 A.
Minimum reduced to freezing,	28.55, 25th, 4 A.
Reduced† maximum reading,	30.75, 28th, 7 A.
Reduced† minimum reading,	28.86, 25th, 4 A.
Mean tri-daily reduced,	29.967
Monthly range,	1.89

****Air Temperature.*** In Degrees Fahr.

Highest,	56.0, 13th, 1 P.
Lowest,	-8.0, 3d, 6:30 A.
Mean hourly,	24.6
Mean of means of max. and min.,	24.6
Mean sensible (wet bulb),	22.8
Monthly range,	64.0
Highest mean daily,	43.5, 13th
Lowest mean daily,	3.4, 2d
Mean maximum,	33.5
Mean minimum,	15.9
Mean daily range,	17.4
Greatest daily range,	36.0, 25th
Least daily range,	3.0, 8th

Humidity.

Mean dew point,	17.8
Mean force of vapor,	.147
Mean relative humidity,	77.4

Precipitation. In inches.

Total precipitation,	8.12
Number of days on which .01 inch or more rain or melted snow fell,	13.0
Snow total in inches,	6.5
Snow on ground at end of month,	1 inch.

Wind.

Total movement,	5016 m.
Greatest daily movement,	435 m., 26th
Least daily movement,	2 m., 4th
Mean daily movement,	179.0 m.
Mean hourly velocity,	7.5 m.
Maximum pressure per square foot, 30.5 lbs.= 78 m. per hour, 25th, 11:00 P., W.N.W.	

Prevailing Direction, West North West.

Summary.

North,	11 per cent.
Northwest,	21 " "
Northeast,	11 " "
Southwest,	11 " "
South Southwest,	14 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	62 per cent.
Total cloudiness recorded by the Sun Thermometer,	175 hrs.= 59per cent.
Number of clear days,	7
Number of fair days,	8
Number of cloudy days,	13

Bright Sunshine.

Number of hours recorded, . . . 120 hrs.=41%

Rain, 4th, 5th, 8th, 9th, 12th, 13th, 17th, 18th, 22d, 23d, 24th, 25th.

Snow, 4th, 5th, 6th, 11th, 15th, 17th, 18th, 23d, 25th, 28th.

Thunder and Lightning, ... 24th.

Gales, 35 miles or more per hour, 44m., 1st, W.; 53m., 5th, N.; 55m., 13th, N.W.; 50m., 14th, N.W.; 45m., 15th, N.W.; 42 m., 18th, N.; 37m., 19th, N.W.; 52m., 22d, N.E.; 78m., 25th, W.N.W.; 51m., 26th, N.W.

No. days sleighing, ... 12

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.93	29.54	29.756	13.5	3 P	−1.0	7 A	6.2	6.9	5.4	5
2	30.04	29.93	30.015	15.5	3 P	−4.0	6:30 A	5.7	3.4	3.1	8
3	30.24	30.04	30.179	26.0	2:30 P	−8.0	6:30 A	9.0	9.3	7.7	10
4	30.24	29.44	29.898	32.0	12 P	2.0	2 A	17.0	18.9	20.4	0
5	30.02	29.11	29.661	38.0	3 A	19.0	12 P	28.5	29.0	25.8	5
6	30.15	29.88	30.007	35.0	8 P	13.0	6 A	24.0	24.9	25.5	3
7	30.39	30.15	30.317	38.5	3 P	13.0	7:30 A	25.8	28.5	26.0	8
8	30.30	30.09	30.142	36.0	11 A	33.0	6:30 A	34.5	34.7	34 0	0
9	30.34	29.94	30.149	40.0	3 P	30.0	12 P	35.0	35.7	33.0	1
10	30.43	30.29	30.356	34.0	3 P	23.5	6:30 A	28.7	28.8	25.3	5
11	30.32	30.20	30.267	38.0	3 P	22.0	4 A	30.0	30.5	29.5	0
12	30.39	30.10	30.307	38.0	12 P	30.5	6 A	34.2	34.6	34.7	0
13	30.10	29 39	29.644	56.0	1 P	35 0	12 P	45.5	43.5	42 0	0
14	30.12	29.81	30.094	35.0	3 P	25.5	12 P	30 3	31.7	26.0	8
15	30.09	29.68	29.905	43.0	4 P	24.0	7:30 A	33.5	32.8	29.2	4
16	30.06	29.91	30.043	27.5	3 P	16.0	6:30 A	21.7	22.5	19.0	2
17	30.07	29.69	29.921	32.0	1 P	18.5	12 P	25.3	23.3	20.9	1
18	29.69	29 50	29.574	22.5	3 P	15.5	6 A	19.0	17.8	16.5	2
19	30.03	29.67	29.828	24.5	3 P	8.0	6 A	16.2	17.7	15.2	6
20	30.34	30.03	30.251	38.0	4 P	14.0	2 A	25.0	26.3	23.1	10½
21	30.32	30.05	30.187	41.0	4 P	12.5	6 A	26.8	28.9	26.1	8
22	30.05	29.29	29.464	45.0	3 P	32.0	12 P	38.5	38.9	38.2	0
23	29.58	29.24	29.363	40 0	2:30 P	32.0	6 A	36.0	34.6	33.8	0
24	29.70	29.11	29.526	46.0	9 P	32.0	6 A	39.0	39 8	38.0	5
25	29.47	28.86	29.142	45.0	1 A	9.0	12 P	27.0	18.5	13.3	8
26	30.24	29.47	29.899	14.5	2:30 P	3.0	12 P	8.8	9.2	7.4	9
27	30.73	30.24	30.666	15.5	4 P	−6 0	6 A	4.8	4.8	4.7	11
28	30.75	30.30	30.568	23.0	3 P	0.0	6 A	11.5	13.5	13 9	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	−2.3	.063	67.3	W.	220	9.5	44	11 A				
2	1.7	.055	90.0	S.W.	85	3.0	24	12 M				
3	0.0	.081	68.7	S.W.	34	1.0	14	2 P				
4	18.0	.121	89.0	N.	2	0.0	—	—	10 A	12 P	.35	T
5	20.7	.153	77.3	N.N.W.	406	14.0	53	11 A	0 A	9 A	1.65	1.0
6	20.7	.156	77.3	S.S.W.	100	1.0	14	9 P	10 A			T
7	21.0	.168	75.7	S.S.W.	42	0.5	10	10 A				
8	33.0	.200	93.7	W.	33	1.0	14	7 P	9:30 A	12 P	.66	
9	27.7	.211	74.7	N.	168	4.0	28	12 M	0 A	7 A	.24	
10	18.0	.158	65.7	N.N.E.	249	5.5	33	9 A				
11	25.3	.161	81.1	N.N.E.	84	1.0	14	12 M	7 A	12 P		T
12	34.0	.178	98.7	E.	22	2.5	22	12 P	0 A	12 P	.25	
13	41.0	.284	96.3	S.W.	222	15.0	55	11 P	0 A	7 P	2.85	
14	16.3	.168	57.3	N.W.	313	12.5	50	11 A				
15	23.3	.185	73.0	W.S.W.	160	10.0	45	9 P	7 P			T
16	10.3	.119	61.7	N.W.	140	3.5	26	1 A				
17	16.7	.123	81.0	N.E.	147	3.5	26	12 M	3 P	12 P	**	
18	13.0	.099	85.3	N.	413	9.0	42	5 A	0 A	9 A	.26	
19	7.7	.101	65.0	N.W.	284	1.0	37	12 M				
20	15.3	.145	67.7	N.W.	163	4.0	28	2 A				
21	17.7	.179	64.3	S.	76	3.0	24	12 M				
22	36.7	.242	90.7	N.N.E.	349	13.5	52	7 A	1 A	12 P	.55	
23	31.0	.203	86.3	N.W.	118	3.0	24	8 P	0 A	11 A	.10	T
24	33.0	.265	72.7	S.S.W.	166	4.5	30	3 P	10 P	12 P	.23	
25	8.0	.089	73.3	W.N.W.	384	30.5	78	11 P	0 A	9 A	.93	1.0
26	1.0	.068	71.3	N.W.	435	13.0	51	4 P				
27	0.0	.061	77.7	N.N.W.	166	5.0	32	1 A				
28	10.7	.092	84.7	S.S.W.	35	0.0	—		3 P	11 P	.05	0.5

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for February was especially noticeable for the disagreeable features presented. Rain and wind storms were prominent and an unusual amount of cloudiness was noted.

The mean barometer was about a tenth of an inch below the normal and an unusually large range was recorded. The range was the more marked as the time between the minimum and maximum was unusually short. The minimum occurred at 4 A. M. on the 25th when the reduced reading was 28.86 inches. At 9 P. M. on the 27th the reading was 30.73 inches, showing a rise of 1.87 inches in 65 hours. The minimum is one of the lowest records at this station. The record of wind movement shows that on 8 days more than 240 miles was registered and on 3 days more than 400 miles was registered, —unusual amounts for this locality. The total wind movement for the month was only about 350 miles more than normal.

The mean temperature for the month was nearly normal; the range about 4 degrees more than usual.

The precipitation was over two and one-half times the normal amount and most of it was rain. The storm of the 12th-13th was one of the heaviest in this locality for a number of years, three inches of rain occurring in 24 hours. Falling on snow and frozen ground the streams became quickly swollen and much damage was done by the high water in the Connecticut river and its tributaries.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 135. MARCH, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.27, 8th, 8 A.
Minimum reduced to freezing, 28.75, 2d, 1 A.
Reduced† maximum reading, 30.59, 8th, 8 A.
Reduced† minimum reading, 29.06, 2d, 1 A.
Mean tri-daily reduced, ... 29.948
Monthly range, ... 1.52

****Air Temperature.*** In Degrees Fahr.

Highest, ... 49.0, 19th, 3 P.; 30th, 3 P.
Lowest, ... 3.0, 18th, 6 A.
Mean hourly, ... 29.5
Mean of means of max. and min., ... 29.1
Mean sensible (wet bulb), ... 26.6
Monthly range, ... 46.0
Highest mean daily, ... 40.0, 23d
Lowest mean daily, ... 15.4, 12th
Mean maximum, ... 38.4
Mean minimum, ... 19.8
Mean daily range, ... 18.6
Greatest daily range, ... 33.5, 9th
Least daily range, ... 7.5, 21st

Humidity.

Mean dew point, ... 19.3
Mean force of vapor, ...175
Mean relative humidity, ... 67.8

Precipitation. In inches.

Total precipitation, ... 5.76
Number of days on which .01 inch or more rain or melted snow fell, ... 9.0
Snow total in inches, ... 13.5
Snow on ground at end of month, . . 0 inches.

Wind.

Total movement, ... 5602 m
Greatest daily movement, ... 317 m., 12th
Least daily movement, ... 23 m., 26th
Mean daily movement, ... 181.0 m.
Mean hourly velocity, ... 7.5 m.
Maximum pressure per square foot, 16.0 lbs.= 57 m. per hour, 2d, 9 A., N.W.
Prevailing Direction, North West.

Summary.

North, ... 13 per cent.
Northwest, ... 35 " "
North. Northwest, ... 10 " "
Southwest, ... 16 " "
Other directions, ... 26 " "

Weather.

Mean cloudiness observed, ... 47 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 155 hrs.=42 per cent.
Number of clear days, ... 9
Number of fair days, ... 17
Number of cloudy days, ... 5

Bright Sunshine.

Number of hours recorded, . . . 216 hrs.=58%

Rain, 1st, 2d, 5th, 6th, 16th, 18th, 19th, 20th, 23d, 26th, 27th.

Snow, 1st, 2d, 5th, 6th, 15th, 16th, 18th, 26th, 27th.

Sleet, 6th, 16th.

Gales. 35 miles or more per hour. 57m., 2d, N.W.; 38m., 3d, N.N.W.; 38m., 5th, N.N.E.; 53m., 7th, N.W.; 40m., 11th, N.W.; 49m., 12th, N.N.E.; 44m., 17th, S.S.W.; 35m., 19th, S.W.; 43m., 21st, N.W.; 39m., 23d, N.W.; 36m., 28th, N.W.; 36m., 31st, N.

No. days sleighing, ... 4

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.30	29.07	29.606	45.0	6:30 P	18.5	9 A	31.7	30.3	33.3	0
2	29.67	29.06	29.464	37.0	0 A	26.0	12 P	31.5	29.7	25.5	2
3	30.18	29.67	29.980	30.5	4 P	21.0	6:30 A	25.7	26.4	23.0	6
4	30.27	30.10	30.180	44.0	4 P	20.5	2 A	32.2	33.5	31.7	5
5	30.57	30.15	30.424	29.5	2:30 P	18.0	12 P	23.7	24.1	20.3	7
6	30.57	29.79	30.159	29.0	12 P	13.0	5 A	21.0	19.7	20.1	0
7	30.45	29.78	30.186	37.5	4 A	25.0	1:30 A	31.2	31.1	27.3	7
8	30.59	30.45	30.516	43.0	4:30 P	13.0	6:30 A	28.0	28.7	25.1	10
9	30.47	29.91	30.140	48.0	4 P	14.5	6:30 A	31.2	33.3	31.3	11
10	29.91	29.65	29.724	48.0	3 P	30.0	6 A	39.0	36.0	32.8	7
11	29.98	29.78	29.911	24.5	4 P	13.0	12 P	18.7	19.4	14.9	11
12	30.15	29.98	30.099	24.0	3 P	5.0	6:30 A	14.5	15.4	11.6	11
13	30.13	29 89	30.009	36.0	3 P	6.0	6:30 A	21.0	23.8	21.6	6
14	30.05	29.85	29.920	39.0	1 P	20.0	12 P	29 5	30.5	26.0	7
15	30.11	29.82	30.032	25.5	3 P	16.0	6 A	20.7	20.9	19.5	0
16	29.83	29.27	29.512	33.5	2 P	18.0	12 P	25.8	26.0	26.2	6
17	30.20	29.83	30.049	26.5	2:30 P	7.0	12 P	16.7	16.9	14.7	9
18	30.26	30.04	30.193	24.0	9 P	3.0	6 A	13.5	15.8	15.3	7
19	30.04	29.61	29.745	49.0	3 P	23.0	6 A	36.0	38.0	37.7	3
20	29.81	29.55	29.687	46.5	12 P	31.0	12 P	38.8	39.7	35.7	5
21	30.15	29.81	30.012	32.0	12 M	24.5	6 A	28.2	29.0	25.0	7
22	30.17	29.97	30.040	43.5	3 P	21.0	6 A	32.3	34.1	30.8	11
23	29.97	29.83	29.888	48.5	3 P	32.0	12 P	40.2	40.0	34.8	8
24	30.05	29.94	29.982	34.5	3 P	22.0	12 P	28.3	29.0	24.5	12
25	30.06	29.91	29.970	42.0	3 P	18.0	5 A	30.0	30.1	26.0	12
26	29.91	29.64	29.759	40.0	1 P	19.0	6 A	29.5	29.7	29.2	6
27	29.82	29.60	29.719	45.5	3 P	28.0	6 A	36.7	36.0	33.3	7
28	29.91	29 76	29.821	43.5	3 P	26.0	6 A	34.7	35.5	31.2	10
29	30.05	29.91	29.976	45.5	3 P	29.5	5 A	37.5	37.6	32.7	8
30	30.05	29.84	29.917	49.0	3 P	23.0	6 A	36.0	37.3	32.5	5
31	29.84	29.70	29.764	46.0	2:30 P	29.5	6:30 A	37.7	37.2	31.2	10

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	33.3	.194	100.0	N.N.E.	135	3.0	24	3 P	0 A	12 P	2.40	T
2	19.7	.153	72.0	N.W.	303	16.0	57	9 A	0 A	4 A	.05	T
3	16.3	.139	69.7	N.N.W.	307	7.0	38	2 P				
4	26.3	.212	70.7	S.W.	75	1.0	14	2 P				
5	14.7	.124	72.7	N.N.E.	235	7.0	38	7 A	1 A	9 A	.10	1.0
6	18.3	.115	94.3	N.	108	0.0	—	—	2 A	12 P	.80	5.0
7	19.7	.171	65.7	N.W.	260	14.0	53	8 A				
8	17.7	.160	69.3	S.W.	65	2.0	20	0 A				
9	28.3	.205	83.3	S.S.W.	114	2.5	22	4 P				
10	28.3	.178	78.7	N.W.	160	5.5	33	11 A				
11	6.3	.100	63.0	N.N.W.	308	8.0	40	2 A				
12	−2.7	.090	48.3	N.	317	12.0	49	1 P				
13	11.0	.194	55.0	N.W.	77	1.5	17	0 A				
14	17.3	.169	62.3	N.W.	170	4.0	28	12 M				
15	14.7	.116	77.3	N.	108	1.0	14	3 A	1:30 P	12 P	**	**
16	23.0	.153	85.3	N.W.	193	5.5	33	4 P	0 A	11 A	1.95	5.0
17	4.3	.110	60.3	W.	217	9.5	44	1 P				
18	7.0	.104	53.7	S.W.	160	4.0	28	7 P	2 P	8 P		T
19	34.7	.257	83.0	S.W.	126	6.0	35	10 P	4 P	12 P	.18	
20	29.3	.241	70.7	W.N.W.	179	3.0	24	6 P	0 A	6 A	.06	
21	17.0	.155	64.0	W.N.W.	310	9.0	43	1 P				
22	22.3	.210	60.3	S.W.	161	4.0	28	11 P				
23	26.0	.249	60.3	W.	230	7.5	39	3 P	1 P		T	
24	14.3	.159	55.7	N.W.	256	5.5	33	11 A				
25	14.0	.177	52.3	N.W.	104	1.5	17	8 A				
26	25.0	.175	82.0	W.S.W.	23	4.0	28	3 P	1:45 P	12 P	.22	2.5
27	26.7	.226	68.3	N.W.	92	4.0	28	4 P	0 A	3 A	T	T
28	22.3	.212	58.7	N.W.	249	6.5	36	4 P				
29	21.3	.231	54.0	N.W.	169	3.5	26	10 A				
30	23.0	.235	58.3	N.N.W.	86	1.5	17	2 P				
31	20.3	.223	52.3	N.	305	6.5	36	4:30 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month was more pleasant than usual for March, and the equinoctial period was passed with less than the ordinary amount of stormy weather expected at that time. The change from winter to spring was effected although the temperature remained relatively low. The month closed with the season slightly backward.

A comparison of some of the weather elements prevailing during the month with normal conditions shows the following characteristics of interest. The mean barometer was quite low; the range considerably more than the normal amount. The change in pressure on the 1st was especially marked, showing a fall of 1.23 inches for the day. The total wind movement was slightly below the normal although many moderate gales were recorded for the month.

The mean temperature was nearly four degrees below the average; the range less than usual. The mean dew point and relative humidity were unusually low.

The precipitation for the month was about 85 per cent above the normal and the greatest for March on our records. Nearly all of it occurred in three well defined storms so that its effect on the general character of the weather was not especially noticeable. The amount of sunshine was large and the number of cloudy days very small.

The roads have begun to dry in places, although much frost is still in the ground.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 136. APRIL, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.17, 16th, 7 A.
Minimum reduced to freezing, 29.17, 7th, 4 P.
Reduced† maximum reading, 30.48, 16th, 7 A.
Reduced† minimum reading, 29.47, 7th, 4 P.
Mean tri-daily reduced, ... 29.956
Monthly range, ... 1.01

****Air Temperature.*** In Degrees Fahr.

Highest, ... 80.0, 30th, 2:30 P.
Lowest, ... 21.0, 10th, 5:30 A.
Mean hourly, ... 46.9
Mean of means of max. and min., ... 45.8
Mean sensible (wet bulb), ... 42.2
Monthly range, ... 59.0
Highest mean daily, ... 60.3, 19th
Lowest mean daily, ... 32.5, 9th
Mean maximum, ... 57.7
Mean minimum, ... 33.9
Mean daily range, ... 23.8
Greatest daily range, ... 44.5, 30th
Least daily range, ... 8.0, 12th

Humidity.

Mean dew point, ... 34.9
Mean force of vapor, ...349
Mean relative humidity, ... 64.7

Precipitation. In inches.

Total precipitation, ... 1.85
Number of days on which .01 inch or more rain or melted snow fell, ... —7
Snow total in inches, ... Traces

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 5039 m.
Greatest daily movement, ... 372 m., 7th
Least daily movement, ... 30 m., 21st
Mean daily movement, ... 168.0 m.
Mean hourly velocity, ... 7.0 m.
Maximum pressure per square foot, 13.0 lbs.= 51 m. per hour, 26th, 3 P., N.N.E.
Prevailing Direction, North Northwest.

Summary.

North, ... 23 per cent.
Northwest, ... 10 " "
North, Northwest, ... 10 " "
North Northeast, ... 23 " "
Southwest, ... 10 " "
Other directions, ... 24 " "

Weather.

Mean cloudiness observed, ... 46 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 203 hrs.=47 per cent.
Number of clear days, ... 9
Number of fair days, ... 12
Number of cloudy days, ... 9

Bright Sunshine.

Number of hours recorded, . . . 227 hrs.=53%

Rain, 2d, 3d, 12th, 13th, 14th, 17th, 18th, 19th, 22d, 23d, 30th.

Snow, 9th.

Thunder and Lightning, 30th.

Gales, 35 miles or more per hour, 5om., 1st, W.N.W.; 36m., 2d, S.W.; 39m., 3d, N.W.; 48m., 6th, N.N.W.; 47m., 7th, N.; 39m., 8th, N.N.W.; 39m., 14th, W.; 42m., 19th, W.N.W.; 37m., 24th, N.E.; 43m., 25th, N.E.; 51m., 26th, N.N.E.; 37m.,127th, N.E.; 48m, 30th, S.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.01	29.86	29.938	50.5	3 P	28.5	6 A	39.5	42.2	35.5	12
2	30.05	29.92	29.988	57.5	12 M	31.0	5:30 A	44.2	44.7	39.0	4
3	29.95	29.70	29.753	49.0	4 P	31.0	5 A	40.0	40.1	38.8	2
4	30.11	29.78	29.965	48.0	1 P	32.0	4:30 A	40.0	39.8	34.2	8
5	30.17	29.83	30.018	53.5	3 P	27.0	5:30 A	40.3	42.7	35.3	13
6	29.83	29.59	29.664	59.0	12 M	31.0	5:30 A	45.0	46.3	38.5	13
7	29.62	29.47	29.543	57.0	3 P	36.0	12 P	46.5	47.2	39.8	13
8	29.79	29.57	29.650	52.0	1 P	28.0	5 A	40.0	40.3	35.0	9
9	29.99	29.79	29.876	39.5	1 P	25.0	6 A	32.3	32.5	27.3	8
10	30.22	29.99	30.098	43.0	3 P	21.0	5:30 A	32.0	33 6	30.2	7
11	30.32	30.22	30.280	54.5	6 P	25.0	6 A	39.7	42.3	38.0	9
12	30 27	29.97	30.110	41.0	3 P	33.0	5:30 A	37.0	37.5	38.0	0
13	29.97	29 75	29.812	43.5	1 P	32.0	12 P	37.8	38.6	38.7	0
14	30.06	29.82	29 931	51.0	3 P	28.5	6 A	39 7	42.0	39.5	6
15	30.34	30.06	30.233	61.0	3 P	34.0	5:30 A	47.5	49.5	41.8	12
16	30.48	30.34	30.434	66.0	4 P	28.5	6 A	47.3	50.2	46.7	11
17	30.45	30.23	30.373	50.0	9 P	41.0	9 A	45.5	45.3	46.2	0
18	30.23	29.94	30.051	56.5	12 P	47.0	9 A	51.7	53.7	54.2	0
19	30.02	29.73	29.869	75.5	3 P	53.0	12 P	64.3	60.3	53.0	8
20	30.15	30.02	30.110	71.0	4 P	43.0	12 P	57.0	58.5	50.3	13
21	30.19	30.00	30.091	71.0	1:30 P	34.0	5 A	52.5	54.7	50.2	8
22	30.00	29.91	29.942	64.0	1 P	47.5	6 A	55.8	54.1	52.0	3
23	29.94	29 83	29.861	61.0	5 P	49.0	5 A	55.0	54.4	54.3	2
24	30.07	29.84	29.919	68.0	1:30 P	41.0	12 P	54.5	55.7	46.5	10
25	30.08	29.89	29.979	64 0	4 P	30.0	5:30 A	47.0	50.4	43 7	13
26	29.95	29.66	29.785	65.0	1 P	36.0	3:30 A	50.5	51.4	42.0	10
27	29.91	29.75	29.809	51.0	9:30 A	30 0	5 A	40.5	43.2	38.2	6
28	30.08	29.92	29.978	56.5	4 P	30.0	5 A	43.2	45.6	40 2	5
29	30.08	29.83	29.936	71.5	4 P	28.0	5 A	49.7	52.5	46.3	12
30	29.88	29.48	29.693	80.0	2:30 P	35.5	5 A	57.7	57.6	51.3	10

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	23.3	.276	48.0	N.W.	208	12.5	50	2 P				
2	31.3	.298	60.3	S.	152	6.5	36	5 P	1 P	3 P	T	
3	35.7	.260	82.7	N.W.	106	7.5	39	5 P	12 M	4 P	T	
4	23.3	.252	51.7	N.	243	3.5	26	9 A				
5	24.0	.279	49.3	N.N.W.	154	2.5	22	12 M				
6	28.0	.313	53.7	N.	257	11.5	48	2 P				
7	27.7	.337	49.0	N.	372	11.0	47	9 A				
8	24.0	.269	49.7	N.N.W.	178	7.5	39	3 P				
9	17.3	.180	55.0	N.N.W.	246	4.5	30	2 P				T
10	21.0	.204	56.7	N.	144	3.0	24	10 P				
11	29.7	.295	57.7	N.	113	3.0	24	8 A				
12	37.0	.234	94.3	N.N.E.	87	0.0	—	—	6 A	12 P	.46	
13	37.7	.243	93.0	N.N.E.	113	0.0	—	—	1:30 P	7 P	.01	
14	34.3	.285	70.7	W.	207	7.5	39	5 P	11:30 A		T	
15	30.7	.368	49.7	N.W.	152	4.0	28	11 A				
16	41.7	.360	71.7	S.W.	50	0.5	10	2 P				
17	45.3	.324	96.0	S.	44	1.5	17	9 P	6:30 A	12 P	.13	
18	53.0	.435	94.0	S.S.W.	236	5.0	32	6 A	0 A	12 P	.89	
19	45.3	.487	62.3	W.	303	9.0	42	3 P	0 A	9 A	T	
20	42.7	.500	59.3	N.	178	5.0	32	12 M				
21	44.3	.504	64.7	S.W.	30	0.0	—	—				
22	50.0	.424	86.3	E.	61	1.0	14	7 A	3 P	12 P	.08	
23	53.3	.436	95.0	N.E.	28	1.5	17	12 P	0 A	3 P	.22	
24	43.3	.463	64.0	N.N.E.	268	7.0	37	4:30 P				
25	34.3	.395	53.3	N.N.E.	252	9.0	43	3 P				
26	25.0	.421	35.7	N.N.E.	307	13.0	51	3 P				
27	33.0	.294	67.3	N.N.E.	233	7.0	37	2 P				
28	32.0	.317	59.7	N.N.E.	139	4.0	28	2 P				
29	36.3	.465	52.3	N.	66	3.0	24	3 P				
30	44.0	.585	59.0	S.W.	112	11.5	48	5 P	5:15 P	6:30 P	.06	

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month was generally pleasant and, excepting the small amount of rainfall, the departures from normal conditions were unimportant. The season which was about a week backward at the beginning of the month has made only normal progress and was fully as much behind when the month closed.

The barometer for the month was fairly steady; the fluctuations generally slow and of small amount. The mean pressure was rather low and the range small for the time of year.

The mean temperature was over a degree above the normal; the maximum and minimum both high, giving about the usual range. A few cold days near the end of the month were especially noticeable.

The total wind movement was about normal with an average number of gales. An unusual feature was the great number of days with wind from the northerly directions.

The mean relative humidity and dew point were both low; the amount of sunshine was about normal.

The precipitation was nearly an inch less than the average and almost the same as for April last year. More than half of it occurred during the storm of the 17th–18th.

Most of the frost left the ground early in the month without affecting the condition of the roads as much as usual. Some repairs have already been made on the roads but considerable must still be done to put them in good condition.

Spring work is generally backward owing to the lateness of the season.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 137. MAY, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.08, 29th, 7 A.
Minimum reduced to freezing,	29.09, 3d, 4 P.
Reduced† maximum reading,	30.38, 29th, 7 A.
Reduced† minimum reading,	29.39, 3d, 4 P.
Mean tri-daily reduced,	29.907
Monthly range,	.99

****Air Temperature.*** In Degrees Fahr.

Highest,	91.5, 15th, 1 P.
Lowest,	24.0, 11th, 5 A.
Mean hourly,	55.4
Mean of means of max. and min.,	55.1
Mean sensible (wet bulb),	50.2
Monthly range,	67.5
Highest mean daily,	78.1, 15th
Lowest mean daily,	38.8, 10th
Mean maximum,	68.9
Mean minimum,	41.4
Mean daily range,	27.5
Greatest daily range,	47.5, 27th
Least daily range,	2.5, 19th

Humidity.

Mean dew point,	43.7
Mean force of vapor,	.497
Mean relative humidity,	65.5

Precipitation. In inches.

Total precipitation,	3.78
Number of days on which .01 inch or more rain or melted snow fell,	10
Snow total in inches,	

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4381 m.
Greatest daily movement,	260 m., 9th
Least daily movement,	32 m., 29th
Mean daily movement,	141.3 m.
Mean hourly velocity,	5.9 m.
Maximum pressure per square foot,	22 lbs.= 66 m. per hour, 5th, 12 M., N.W.
Prevailing Direction,	W.N.W.

Summary.

North,	19 per cent.
Southwest,	10 " "
West,	16 " "
Northwest,	16 " "
Other directions,	39 " "

Weather.

Mean cloudiness observed,	54 per cent.
Total cloudiness recorded by the Sun Thermometer,	218 hrs.=48 per cent.
Number of clear days,	8
Number of fair days,	12
Number of cloudy days,	11

Bright Sunshine.

Number of hours recorded, . . . 235 hrs.=52%

Rain, 3d, 4th, 5th, 6th, 8th, 9th, 15th, 18th, 19th, 21st, 24th, 28th, 30th.

Thunder and Lightning, 3d, 8th, 9th, 15th, 18th, 24th.

Frosts, 6th, 7th, 10th, 11th, 12th, 21st, 26th, 27th, 29th,

Gales, 35 miles or more per hour, 52m., 1st, N.W.; 47m., 4th, N.W.; 66m., 5th, N.W.; 37m., 6th, N.W.; 37m., 9th, N.W.; 47m., 15th, W.N.W.; 35m., 18th, S.W; 37m., 21st, W.; 36m., 22d, W.N.W.; 34m., 24th, N.N.E.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.95	29.70	29.834	61.5	3 P	39.0	5 A	50.3	51.6	43.3	12
2	30.02	29.77	29.906	70.5	3 P	29.5	6 A	50.0	53.2	46.0	12
3	29.77	29.39	29.547	68.0	4 P	46.5	5 A	57.2	53.7	51.8	4
4	29.86	29.53	29.759	53.5	4 P	43.0	6:30 A	48.2	46.7	40.7	4
5	30.08	29.84	29.989	51.0	3 P	37.0	5 A	44.0	42.5	38.7	7
6	30.07	29.87	29.989	58.0	3 P	28.5	6 A	43.2	45.2	41.5	4
7	30.21	30.02	30.193	58.0	5 P	34.0	5 A	46.0	46.8	40.5	12
8	30.16	29.54	29.842	69.0	4 P	37.0	3 A	53.0	54.0	54.8	3
9	29.89	29.43	29.649	69.0	8:30 A	37.0	12 P	53.0	53.5	50.5	1
10	30.07	29.89	30.001	47.0	1 P	27.5	5 A	37.3	38.8	36.3	7
11	30.10	29.84	29.964	59.5	4 P	24.0	5 A	41.7	44.5	39.7	8
12	30 04	29.91	30.001	68.5	1:30 P	31.0	5 A	49.8	53.4	45.7	12
13	30.00	29 85	29.920	80.5	4:30 P	45 0	5 A	62.7	62.0	58.3	6
14	29.95	29.75	29.842	89.5	3 P	54.5	5 A	72 0	73.7	63.7	13
15	29.90	29.68	29.782	91.5	1 P	64.0	12 P	77.7	78.1	67.0	11
16	30.11	29.90	30.069	75.0	5 P	52.5	5 A	63.7	61.3	53.2	10
17	30.14	29.92	30.044	65.5	2 P	48.5	5 A	67.0	55.0	53.8	1
18	29.92	29.63	29.734	79.0	12 M	49.0	12 P	64.0	60.5	60.7	4
19	29.71	29.50	29.587	49.0	2 P	46.5	5 A	47.7	48.3	48.0	0
20	29.72	29.49	29.637	61.0	2:30 P	47.5	5 A	54.3	51.5	47.5	5
21	29.77	27.64	29.713	64.5	11 A	37.0	5 A	50.8	51.3	49.2	5
22	29.91	29.76	29.850	70.5	3 P	39.0	5 A	54.7	56.9	52.0	12
23	29.97	29.87	29.922	76.0	3 P	43.0	5 A	59.5	60.1	54.0	11
24	29.99	29.85	29.935	80.5	3 P	49.0	5 A	64.8	60.8	55.7	6
25	30.30	29.99	30.194	66.0	3 P	52.0	5 A	59.0	57.3	48.7	6
26	30.30	30.08	30.173	70.5	3 P	33.0	6 A	51.7	53.8	46.5	10
27	30.08	29.85	29.940	84.5	3 P	37.0	5 A	60.7	62.6	53.5	15
28	30.32	29.95	30.249	58.0	1:30 A	44.0	12 P	51.0	51.4	46 0	0
29	30.38	30.21	30.315	75.0	4 P	32.0	5 A	53.5	56.3	50.2	14
30	30.26	29.98	30.103	79.5	3 P	42.0	5 A	60.7	62.2	56.2	10
31	29.98	29.85	29.950	87.5	2:30 P	53.0	5 A	70.2	70.5	63.2	10

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	33.7	.383	52.3	N.W.	230	13.5	52	11:30 A				
2	37.0	.472	56.0	S.S.W.	107	3.0	24	4 P				
3	49.3	.431	84.3	N.	100	2.5	22	8 P	4 A	12 P	.92	
4	34.7	.302	69.0	N.W.	233	11.0	47	1 P	0 A	4 A	.04	
5	31.7	.335	66.7	N.W.	222	22.0	66	12 M	0 A	4 A	.09	
6	31.7	.351	54.0	W.	170	7.0	37	5 P	4 P	6 P	T	
7	31.3	.333	55.7	N.	143	3.0	24	2 A				
8	52.7	.485	86.3	S.S.W.	237	4.5	30	7 P	6 A	11 A	.31	
9	4.87	.435	85.7	N.	260	7.0	37	9 A	8:30 A	11 A	.32	
10	30.7	.246	72.7	N.	220	5.5	33	10 A				
11	29.3	.328	58.0	W.	122	4.5	30	1 P				
12	33.7	.462	49.3	S.W.	89	3.0	24	9 P				
13	53.0	.666	66.3	W.	91	1.5	17	3 P				
14	55.7	.941	53.0	S.W.	108	4.5	30	1 P				
15	61.0	.762	60 3	W.	203	11.0	47	7 P	6:30 P	9 P	.05	
16	46.0	.547	60.3	N.	133	3.5	26	7 A				
17	51.0	.476	81.7	S.	94	2.0	20	5 P				
18	58.0	.595	84.0	S.	146	6.0	35	2 P	4:15 P	12 P	.78	
19	47.3	.343	95.3	N.N.E.	158	1.5	17	2 P	0 A	11 P	1.22	
20	42.7	.394	73.0	N.	156	4.0	28	3:30 P				
21	44.7	.423	71.7	W.	116	7.0	37	1 P	1:30 P	3 P	.01	
22	46.3	.518	66.0	N.W.	164	6.5	36	3 P				
23	49.0	.578	69.0	S.E.	44	0.0	—	—				
24	49.3	.627	64.3	S.E.	73	6.5	36	5 P	4:30 P	10 P	.04	
25	38.7	.486	50.7	E.N.E.	246	4.5	30	11 A				
26	34.7	.472	47.3	E.S.E.	82	1.0	14	5 A				
27	42.3	.694	48.7	N.W.	52	1.0	14	11 A				
28	40.7	.378	66.3	E.N.E.	121	1.0	14	11 A	10:30 A	12 M	T	
29	42.0	.519	58.0	W.S.W.	32	1.0	14	3 P				
30	49.0	.635	60.7	S.W.	130	2.5	22	3 P	7 P	8 P	T	
31	57.3	.796	62.7	W.N.W.	99	2.0	20	2 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month was more or less erratic in some of its features; the fluctuations of temperature being especially noticeable.

The mean temperature for the month, which was about two degrees below the normal, gives but little idea of the conditions that existed except to show that the month was unusually cool. An examination of the daily records shows a range of five degrees more than any previous May for ten years. The temperature reached the freezing point on six different days and frost was noticed on nine different dates. From the 10th to the 12th an unusually cold period occurred, the temperature falling to 24° F. on the morning of the 11th. This is the lowest May record at this station. Killing frost was generally noted and ice was formed on shallow water. Although considerable damage was done to early fruit it will probably prove less than was expected, owing to the backwardness of the season. On the 15th the other extreme of temperature was noticed and 91.°5 F. was recorded. This maximum for May has been but twice exceeded here in the last ten years.

Low temperatures were also noted near the last of the month and the frosts of the 26th and 29th did some damage on the low lands.

The mean barometer was below the normal and the range was rather large. During the first part of the month the pressure was rather unsteady though the fluctuations were not large.

The total wind movement was less than usual although gales were noted on a large number of days.

The relative humidity was lower than usual, and the mean dew point abnormally low.

The precipitation was less than half an inch below the normal amount. Over half the total fell during the heavy rain of the 18th and 19th.

Somewhat more than the usual amount of sunshine was recorded.

The month closed with the season backward at least a week.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 138. JUNE, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.92, 13th, 7 A.
Minimum reduced to freezing,	29.23, 28th, 5:30 P.
Reduced† maximum reading,	30.19, 13th, 7 A.
Reduced† minimum reading,	29.51, 28th, 5:30 P.
Mean tri-daily reduced,	29.907
Monthly range,	.67

****Air Temperature.*** In Degrees Fahr.

Highest,	94.0, 27th, 1 P.
Lowest,	40.0, 5th, 5 A.
Mean hourly,	67.1
Mean of means of max. and min.,	67.1
Mean sensible (wet bulb),	61.7
Monthly range,	54.0
Highest mean daily,	75.8, 27th
Lowest mean daily,	59.0, 3d
Mean maximum,	80.5
Mean minimum,	53.6
Mean daily range,	26.9
Greatest daily range,	44.0, 5th
Least daily range,	14.0, 3d

Humidity.

Mean dew point,	57.0
Mean force of vapor,	.732
Mean relative humidity,	69.5

Precipitation. In inches.

Total precipitation,	3.65
Number of days on which .01 inch or more rain or melted snow fell,	8

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4101m.
Greatest daily movement,	320 m., 30th
Least daily movement,	34m., 1st
Mean daily movement,	136.7 m.
Mean hourly velocity,	5.7 m.

Maximum pressure per square foot, 12.5 lbs.= 50 m. per hour, 30th, 2:30 P., N.W.

Prevailing Direction, W.S.W.

Summary.

Southwest,	17per cent.
South Southwest,	23 " "
West,	13 " "
Other directions,	47 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	198 hrs.=43 per cent.
Number of clear days,	6
Number of fair days,	15
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, . . . 259 hrs.=57%

Rain, 1st, 3d, 8th, 11th, 14th, 19th, 22d, 23d, 27th, 28th.

Thunder and Lightning, 2d, 11th, 28th.

Hail, 28th.

Gales, 35 miles or more per hour, 44m., 27th, S. S. W.; 45m., 28th, S. W.; 50m., 30th, N. W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.01	29.94	29.990	84.0	2:30 P	56.0	5 A	70.0	70.6	65.8	6
2	29.97	29.72	29.789	84.0	4 P	62.0	5 A	73.0	72.1	67.5	5
3	30.08	29.78	29.976	65.0	0 A	51.0	12 P	58.0	59.0	57.3	0
4	30.15	30.07	30.140	71.5	3 P	50.5	1 A	61.0	59.8	54.8	13
5	30.13	29.94	30.042	84.0	5 P	40.0	5 A	62.0	63.5	59.5	15
6	30.06	29.94	30.008	87.5	3 P	51.0	5 A	69.3	69.8	63.0	13
7	30.00	29.84	29.901	79.5	1 P	55.0	12 P	67.2	65.2	56.2	11
8	29.87	29.73	29.752	75.5	12 M	55.0	0 A	65.2	66.6	66 8	3
9	30.01	29.75	29.824	83.5	3 P	58.0	12 P	70.7	70.8	64.0	9
10	30.14	30.00	30.081	77.5	3 P	46.0	5 A	61.7	65.5	57.0	15
11	30.06	29.81	29.928	87.0	3 P	49.0	4 A	68.0	66.2	65.0	11
12	30.14	29.95	30.093	77.0	4 P	53.0	12 P	65.0	65.9	61.0	6
13	30.19	30.10	30.158	81.5	3 P	47.0	5 A	64.3	64.5	57.7	12
14	30.10	29.88	29 957	75.0	4 P	53.5	6 A	64 2	63.5	61.2	0
15	30.03	29.95	30.021	78.5	3 P	53.0	12 P	65.7	66.2	56.8	12
16	30.03	29.92	29.972	81.5	3 P	45.0	5 A	63.2	66.1	61.3	9
17	29.97	29.90	29.942	78.0	3 P	52.0	5 A	65.0	65.2	61.5	6
18	30.10	29.96	30.050	75.0	1 P	54.5	5 A	64.7	63.8	57.5	8
19	30.13	30.04	30.097	73.5	3 P	47.0	5 A	60 2	61.2	55.3	5
20	30.04	29.81	29.911	82.5	5 P	52.0	5 A	67.2	67.8	60.3	5
21	29.85	29.72	29.791	86.5	4 P	54.0	5 A	70.2	70.1	63.3	11
22	29.82	29.71	29.808	85.0	1 P	60.5	5 A	72.7	68.3	65.2	3
23	29.97	29.82	29.936	76.0	4 P	56.5	5 A	66.2	65.2	59.7	10
24	29.97	29.72	29.816	82.0	3 P	52.5	4 A	67.3	68.6	67.0	7
25	29.88	29.66	29.737	87.0	5 P	66.0	5 A	76.5	74.5	65.7	13
26	29.96	29.81	29.885	83.0	3 P	48.0	5 A	65.5	68.4	61.3	15
27	29.81	29.59	29.654	94.0	1 P	62.5	5 A	78.3	75.8	73 5	8
28	29.67	29.51	29.611	90.0	4 P	63.0	6:30 P	76.5	75.2	70.3	8
29	29.62	29.51	29.593	83.0	4 P	61.5	5 A	72.2	71.5	64.0	10
30	29.82	29.62	29.745	68.5	1 P	53.0	5 A	60.8	60.8	51.0	10

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	62.0	.840	70.0	W.	34	0.5	10	2 P	7 P	12 P	T	
2	64.0	.857	73.3	S.W.	202	4.5	30	2 P				
3	56.0	.515	87.7	E.N.E.	152	2.5	22	5 P	10:30 A	12 P	.34	
4	50.0	.544	68.3	E.	178	2.0	20	9 A				
5	55.3	.687	69.0	S.S.E.	35	0.5	10	9 P				
6	57.3	.845	60.0	S.S.W.	102	1.5	17	9 P				
7	45.3	.650	54.7	S.S.W.	226	5.0	32	11 A				
8	66.0	.694	92.7	S.S.W.	148	1.0	14	9 A	1 P	7 P	.05	
9	59.3	.805	66.7	N.N.W.	114	3.5	26	1 P				
10	51.0	.642	62.3	S.S.W.	126	2.5	22	6 P				
11	62.3	.798	77.3	S.S.W.	216	5.0	32	5 P	5 P	6:30 P	.26	
12	56.3	.693	69.7	N.N.E.	118	4.5	30	10 A				
13	51.0	.669	62.7	S.S.W.	106	3.0	24	1 P				
14	57.7	.652	78.3	W.	86	1.0	14	6 A	5 A	11 A	.45	
15	49 0	.674	57.3	N.N.E.	138	3.5	26	6 A				
16	56.3	.741	64.0	W.	54	1.0	14	1 P				
17	57.0	.687	72 0	S.	75	3.0	24	5 P				
18	52.3	.616	66.3	E.	154	2.0	20	10 A				
19	54.0	.629	67.3	E.N.E.	84	1.5	17	10 A	1:30 P		T	
20	52.7	.739	63.0	N.	76	2.5	22	2 P				
21	57.0	.852	59.0	W.	125	3.5	26	1 P				
22	64.0	.673	89.7	S.S.W.	122	5.0	32	2 P	1:50 P	12 P	.67	
23	54.7	.658	72.3	S.W.	90	0 5	10	9 P	0 A	5 A	.15	
24	65.3	.770	83.7	S.W.	220	3.5	26	1 A				
25	59.3	.922	59.3	N.	177	2.5	22	3 P				
26	56.0	.784	62.7	S.W.	103	1.5	17	2 P				
27	72.3	.969	84.0	W.S.W.	191	9.5	44	3 P	3 P	8 P	.04	
28	67.7	.962	74.3	S.W.	159	10.0	45	6 P	5:30 P	12 P	1.69	
29	58.7	.833	69.7	N.W.	170	3.5	26	11 A				
30	41.3	.546	49.0	N.W.	320	12.5	50	2:30 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month has been generally pleasant and the departures from normal conditions have been small and unimportant. The mean barometer although unusually low was slightly greater than our lowest June mean, in 1897. The maximum and minimum were both unusually low and the range was a little less than the usual amount.

The total wind movement was about ten per cent above the average. No gales were noted however, until the last four days of the month. On the 30th an unusually high wind prevailed during much of the day.

The mean temperature was slightly above the June average; the range was about normal. The mean dew point and relative humidity were both below the normal. The amount of sunshine was large and comparatively few cloudy days were noted.

The precipitation was but little less than the usual amount and was fairly well distributed through the month. An unusually heavy thunder shower, accompanied by high wind and some little hail, occurred on the afternoon of the 28th. The reports indicate that but little damage resulted in this locality.

Crops have made good progress during the month though as yet they are not up to normal conditions.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 139. JULY, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.87, 22d, 7 A.
Minimum reduced to freezing, 29.14, 8th, 5 P.
Reduced† maximum reading, 30.16, 22d, 7 A.
Reduced† minimum reading, 29.42, 8th, 5 P.
Mean tri-daily reduced, ... 29.914
Monthly range, ...73

****Air Temperature.*** In Degrees Fahr.

Highest, ... 95.5, 17th, 3 P.
Lowest, ... 44.5, 2d, 5 A.
Mean hourly, ... 70.6
Mean of means of max. and min., ... 71.5
Mean sensible (wet bulb), ... 63.0
Monthly range, ... 51.0
Highest mean daily, ... 84.0, 17th
Lowest mean daily, ... 61.2, 1st
Mean maximum, ... 84.0
Mean minimum, ... 59.1
Mean daily range, ... 24.9
Greatest daily range, ... 34.0, 2d, 11th
Least daily range, ... 9.0, 26th

Humidity.

Mean dew point, ... 62.3
Mean force of vapor, ...841
Mean relative humidity, ... 71.1

Precipitation. In inches.

Total precipitation, ... 4.67
Number of days on which .01 inch or more rain or melted snow fell, ... 12

Wind.

Total movement, ... 3701m.
Greatest daily movement, ... 225 m., 1st
Least daily movement, ... 19m., 28th
Mean daily movement, ... 119 m.
Mean hourly velocity, ... 5 m.
Maximum pressure per square foot, 23 lbs.= 68 m. per hour, 7th, 4 P., S.W.
Prevailing Direction, W.S.W.

Summary.

Southwest, ... 10 per cent.
South, ... 26 " "
Northwest, ... 26 " "
Other directions, ... 38 " "

Weather.

Mean cloudiness observed, ... 48 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 203 hrs.= 41 per cent.
Number of clear days, ... 11
Number of fair days, ... 10
Number of cloudy days, ... 10

Bright Sunshine.

Number of hours recorded, . . . 260 hrs. 56%

Rain, 3d, 6th, 7th, 8th, 9th, 12th, 15th, 17th, 18th, 20th, 21st, 24th, 25th, 26th, 30th.

Thunder and Lightning, 6th, 8th, 12th, 15th, 18th, 20th, 21st.

Hail, 12th.

Gales, 35 miles or more per hour, 36m., 1st. N. N. W.; 36m., 3d, S. W.; 68m., 7th, S. W.; 36m. 11th, W. S. W.; 44 m. 12th, S. W.; 39 m., 15th, W.; 39m., 18th, N. W.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.01	29.82	29.925	71.5	3 P	53.5	4 A	62.5	61.2	54.2	12
2	30.16	30.01	30.104	78.5	6 P	44.5	5 A	61.5	63.2	58.0	13
3	30.16	29.87	30.012	73.0	2:30 P.	48.0	5 A	60.5	61.9	61.0	2
4	29.94	29.83	29.898	88.0	3:30 P	62.0	3 A	75.0	75.0	68.3	12
5	30.03	29.90	29.941	87.5	3 P	60.0	5 A	73.7	73.7	65.5	11
6	29.90	29.74	29.801	84.0	4 P	60.0	5 A	72.0	70.4	66.0	7
7	29.73	29.61	29.706	95.0	2:30 P	66.0	5 A	80.5	75.9	73.3	6
8	29.63	29.42	29.500	86.0	4 P	66.0	5 A	76.0	74.2	70.2	5
9	29.72	29.53	29.616	79.5	3 P	57.0	12 P	68.2	64.5	64.0	7
10	29.99	29.72	29.895	77.0	3 P	57.0	5 A	67.0	63.3	61.7	7
11	30.06	29.92	30.011	85.0	4 P	51.0	5 A	68.0.	71.0	66.0	12
12	29.99	29.77	29.900	86.0	2:30 P	60.0	12 P	73.0	71.6	69.2	4
13	29.89	29 77	29.849	76.5	3 P	54.0	5 A	65.2	66.9	62.0	6
14	29.94	29.81	29.878	83.0	5 P	55.0	4 A	69.0	71.1	61.3	8
15	29.97	29.88	29.941	83.0	3 P	55.5	3 A	69.2	72.3	67.2	9
16	29.94	29.84	29.894	94.0	3 P	67.0	4 A	80.5	81.3	74.3	12
17	29.91	29.86	29.891	95.5	3 P	73.0	5 A	84.2	84.0	74.8	11
18	29.95	29.75	29.872	93.0	1 P	66.0	12 P	79.5	79.2	70.7	8
19	30.01	29.92	27.978	86.0	5 P	56.5	5 A	71.2	72.2	63.5	14
20	30.05	29.97	30.016	86.5	3 P	55.0	5 A	70.7	72.5	65.5	12
21	30.04	29.92	29.992	77.5	4 P	63.5	5 A	70.5	69.4	67.7	0
22	30.16	30.04	30.137	86.0	5 P	57.0	5 A	71.5	72.5	66.3	14
23	30.10	30.01	30.060	88.0	2 P	62.0	5 A	75.0	75.6	68.3	4
24	30.02	29.88	29.940	86.5	2:30 P	68.0	5 A	77.2	76.6	71.7	5
25	29.89	29.62	29.723	86.5	1 P	69.5	3 A	78.0	73.9	72.5	2
26	29.93	29.76	29.836	74.0	3 P	65.0	5 A	69.5	67.8	65.7	1
27	30.08	29.93	30.017	81.0	3 P	56.0	5 A	68.5	69.1	61.8	13
28	30.13	30.06	30.092	81.5	3 P	49.0	5 A	65.5	67.3	61.2	14.5
29	30.09	29.97	30.027	85.0	3 P.	52.0	3 A	68.5	70.5	65.2	14.5
30	30.00	29.91	29.963	77.5	4 P	63.0	3 A	70.2	69.9	65.7	3
31	29.99	29.86	29.914	86.0	4 P	59.0	4 A	72.5	73.5	68.8	9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	45.0	.581	56.0	N.N.W.	225	6.5	36	3 P				
2	56.7	.640	65.7	N.N.E.	99	3.5	26	12 M				
3	56.8	.606	82.7	S.W.	159	6.0	36	4 P	5:30 P	9 P	T	
4	63.0	.979	60.7	N.N.W.	144	2.5	22	11 A				
5	59.3	.910	58.7	N.N.E.	53	2.0	20	5 P				
6	62.0	.814	73.7	N.W.	49	0.5	10	5 P	5:30 P	6:20 P	.42	
7	70.3	1.043	77.0	S.W.	105	23.0	68	4 P	3:45 P	5 P	.06	
8	67.7	.900	76.3	W.	186	2.0	20	6 P	5:30 P	6:30 P	.18	
9	60.7	.743	74.3	W.N.W.	94	4.0	28	5 P	5 P	6 P	.55	
10	57.7	.689	72.0	N.W.	99	2.0	20	4 P				
11	61.7	.846	76.3	W.S.W.	171	6.5	36	2 P				
12	67.0	.859	80.7	S.W.	216	9.5	44	4 P	1:15 P	5:30 P	.60	
13	58.3	.677	73.7	N.W.	100	5.5	34	1 P				
14	54.0	.816	53.3	N.W.	144	4.5	30	1 P				
15	64.0	.826	75.5	S.	73	7.5	39	8:45 P	8:45 P	11 P	.31	
16	71.0	1.144	68.3	S.	104	1.5	17	1 P				
17	70.3	1.212	64.3	S.	199	2.0	20	2 P	5:30 P		T	
18	67.3	.982	69.7	W.	191	7.5	39	1 P	1 P	1:20 P	.20	
19	57.7	.832	60.3	N.W.	56	0.5	10	2 P				
20	60.0	.885	62.0	E.S.E.	123	3.0	25	7 P	11 P	12 P	.07	
21	64.7	.720	85.3	N.W.	183	3.5	26	5 P	4:45 P	6:30 P	1.40	
22	62.3	.835	72.0	N.W.	40	0.5	10	8 A				
23	65.0	.931	69.3	S.	60	0.	—	———				
24	69.3	.968	76.0	S.S.E.	119	2.5	22	4 P	4 A	4:30 A	.02	
25	71.3	.887	88.3	S.	184	4.5	30	1 P	6:45 P	12 P	.65	
26	64.0	.681	89.7	E.	64	0.	—	———	0 A	11 P	.21	
27	57.0	.734	67.3	N.W.	71	1.	14	10 A				
28	55.3	.714	66.7	S.E.	19	0.	—	———				
29	61.7	.821	72.0	S.	115	3.0	24	3 P				
30	63.0	.727	81.7	S.	137	1.	14	3 P	12 M	1 P	T	
31	66.0	.857	79.3	S.	99	1.	14	4 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

During the month normal weather conditions have generally prevailed. The weather as a rule was pleasant with the exception of a few uncomfortably warm days. The precipitation was mostly in the form of local showers and thunder storms with an unusual amount of lightning.

The most noticeable departures from normals were in the barometer records. The mean pressure for the month, the maximum and the minimum all furnish new low records for July at this station. The range was about the usual amount. The fluctuations were generally small and slow.

The wind movement was slightly above the average with a considerable number of moderate gales An unusual amount of wind from the south was noted.

The mean temperature was a degree above the normal and the range rather large. The maximum while large has been exceeded twice in the last ten years during the corresponding month. From the 16th to the 19th the only excessively warm period occurred. The amount of sunshine was large with many clear and fair days.

The total precipitation was about an inch less than our large July normal. It considerably exceeded, however, the normals of any of the other months. The thunderstorms of the 12th and 21st were the most severe of the month. On the 12th one death by lightning occurred; a barn in this vicinity was also struck and burned. During the storm of the 21st several buildings were struck without, however, much damage resulting.

Hay harvesting is practically completed and from a fair to good yield is reported. Corn has made rapid progress during the month and a good crop is reported. The condition of tobacco is reported from fair to good.

The fall fruits have progressed well during the month and a large crop is expected in nearly all lines.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 140. AUGUST, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.96, 31st, 12 P.
Minimum reduced to freezing,	29.44, 11th, 5 P.
Reduced† maximum reading,	30.25, 31st, 12 P.
Reduced† minimum reading,	29.72, 11th, 5 P.
Mean tri-daily reduced,	29.988
Monthly range,	.53

****Air Temperature.*** In Degrees Fahr.

Highest,	96.0, 6th, 5-30 P.
Lowest,	43.0, 4th, 5 A.
Mean hourly,	70.1
Mean of means of max. and min.,	70.6
Mean sensible (wet bulb),	65.2
Monthly range,	53.0
Highest mean daily,	82.8, 11th
Lowest mean daily,	61.0, 4th
Mean maximum,	82.6
Mean minimum,	58.6
Mean daily range,	24.0
Greatest daily range,	37.0, 5th
Least daily range,	6.0, 15th

Humidity.

Mean dew point,	62.0
Mean force of vapor,	.781
Mean relative humidity,	75.9

Precipitation. In inches.

Total precipitation,	4.11
Number of days on which .01 inch or more rain or melted snow fell,	13

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	2322m.
Greatest daily movement,	174 m., 15th
Least daily movement,	13m., 26th
Mean daily movement,	75 m.
Mean hourly velocity,	3.1 m.

Maximum pressure per square foot, 16.0 lbs.= 57 m. per hour, 6th, 9 P., N.N.W.

Prevailing Direction, Southeast.

Summary.

Southeast,	32 per cent.
North,	13 " "
South, Southeast,	10 " "
South,	10 " "
Northwest,	10 " "
Other directions,	22 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	203 hrs.=47 per cent.
Number of clear days,	7
Number of fair days,	15
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, . . . 226 hrs.=53%

Rain, 2d, 6th, 7th, 8th, 10th, 13th, 14th, 15th, 16th, 17th, 19th, 24th, 26th, 27th, 28th.

Thunder and Lightning, 6th, 10th, 15th, 16th, 17th, 26th, 27th.

Gales, 35 miles or more per hour, 57m., 6th, N. N. W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.02	29.85	29 935	79 5	3 P	55.0	12 P	67.2	70.4	61.0	7
2	30.03	29.92	29.975	77.5	5 P	45.5	5 A	61.5	65.0	57.2	7
3	30.16	29.95	30.032	78.0	3 P	50.0	12 P	64.0	65.1	57.7	10
4	30.22	30.16	30.205	78.0	3 P	43.0	5 A	60.5	61.0	58.0	9
5	30.22	30.12	30.181	82.0	3 P	45.0	5 A	63.5	66.2	59.7	10
6	30.13	29.92	30.023	96.0	5:30 P	61.0	5 A	78 5	76.7	71.2	10
7	30.12	30.01	30.087	81.5	3 P	64.0	5 A	72.7	70.5	67.8	4
8	30 12	29.93	30.035	72.5	3 P	64.0	4 A	68.2	69.0	67.3	0
9	29.94	29.89	29.924	91.0	3 P	68.0	4 A	79 5	77.9	69.2	12
10	29.97	29.83	29.901	92.0	1 P	61.0	5 A	76.5	77.0	72.2	8
11	29.84	29.72	29.788	94.0	3 P	71.0	5 A	82 5	82.8	71.5	11
12	29 99	29.77	29 935	74.0	2 A	60.0	12 P	67.0	66.9	63.5	1
13	30.01	29.93	29.969	66.5	3 P	56 0	12 P	61.2	62.3	59.3	0
14	30.02	29.92	29 981	78.5	4 P	56.0	4 A	67 3	65.3	62.7	6
15	30.10	30.01	30.052	69.0	4 P	63.0	5 A	66.0	65.9	65.8	2
16	30.01	29.86	29.903	83.5	3 P	66.0	4 A	74.8	71.9	69.0	4
17	30.03	29.91	29.977	85.0	12 M	62.0	12 P	73.5	71.2	66.5	5
18	30 07	29.91	30.000	82.0	4 P	53.0	5 A	67.5	68.1	62.0	8
19	30.06	29.89	30.026	75.5	4 P	53.0	12 P	64 2	65.0	57.5	11
20	30.04	29.91	29.978	78.5	4:30 P	46.0	5 A	62.2	61.8	58.2	8
21	29.98	29.84	29.927	78.5	3 P	52.0	5 A	65.3	64.8	61.5	8
22	29.95	29.84	29.898	80.5	4 P	54 0	5 A	67.3	65.4	61.0	10
23	30.02	29.95	29.992	85.0	3 P	52.5	5 A	68.8	68.4	62.3	12
24	30.00	29.90	29.952	78.0	3 P	63.0	3 A	70.5	71.4	70.5	0
25	29.98	29.92	29.959	94.0	4 P	70.0	12 P	82.0	78.6	74.7	12
26	30.00	29.89	29.959	92.0	12:30 P	64 0	5 A	78.0	75.0	71.7	7
27	29.99	29.87	29.939	94.0	5 P	66.0	12 P	80.0	77.7	71 0	12
28	29 93	29.89	29.919	84.5	5 P	66.0	5 A	75.2	72.7	69.5	5
29	30.02	29.91	29.984	83.5	12 M	65.0	3 A	74.2	73.1	69.0	7
30	30.08	29.98	30.033	88.0	4 P	61.5	5 A	74.7	73.2	64.5	12
31	30.25	30.07	30.147	88.0	3 P	59.0	5 A	73.5	73.3	66.8	8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	55.3	.727	64.0	N.E.	172	3.5	26	12 M				
2	50.0	.662	59.0	S.E.	47	0.5	10	11 P	4 P		T	
3	52.3	.648	64.0	S.E.	155	3.5	26	4 P				
4	55.0	.584	77.0	N.W.	80	1.0	14	2 P				
5	54.3	.732	63.0	S.	70	1.0	14	12 P				
6	68.0	.998	74.0	S.E.	79	16.0	57	9 P	2 A	9:45 P	.34	
7	66.0	.789	83.0	E.N.E.	66	0.0	—	——	8 A	12 P	1.00	
8	66.3	.726	89.0	S.E.	119	1.0	14	2 P	0 A	8 P	.30	
9	70.3	.965	80.0	N.W.	95	2.5	22	12 M				
10	69.0	1.000	75.0	S.E.	42	5.0	32	5 P	2:40 P	5 P	.14	
11	66.0	1.153	57.7	W.	122	3.5	26	1:30 P				
12	61.3	.674	82.3	N.W.	94	1.5	17	9 A				
13	57.0	.577	81.0	E.	37	0.0	—	——	3:30 P	12 P	.25	
14	60.3	.671	80.7	W.	41	0 5	10	10 P	0 A	9 A	.03	
15	64.7	.672	91.7	S.S.E.	174	2.5	22	12 M	11:30 A	1:30 P	.73	
16	67.3	.805	85.3	S.W.	107	0.5	10	10 A	2 A	10 A	1.05	
17	63.7	.782	78.3	S.E.	26	2.0	20	12 M	12 M	6 P	.11	
18	57.7	.711	70.3	S.	50	0.0	--	——				
19	51.0	.639	63.7	N.	158	3.0	24	12 M	2 A		.01	
20	54.3	.621	72.0	N.W.	32	0.5	10	3 P				
21	57.7	.684	75.3	S.S.E.	53	0.0	—	——				
22	58.7	.590	79.0	S.	39	0.0	—	——				
23	58.0	.760	69.7	S.E.	41	0.0	—	——				
24	69.0	.819	87.7	S.E.	115	0.0	—	——	8 A	5 P	T	
25	73.3	.996	86.7	S.E.	36	0.0	—	——				
26	70.0	.889	85.0	N.	13	0.0	--	——	1 P	2 P	T	
27	67.3	1.028	69.0	N.	36	3.5	26	7 P	7 P		T	
28	68.0	.814	85.7	N.	28	0.0	—	——	2 A	1 P	.15	
29	67.0	.812	82.7	S.S.E.	84	0.5	10	9 P				
30	59.7	.829	71.0	S.W.	67	0.5	10	8 P				
31	62.7	.861	70.0	S.E.	44	0.0	—	——				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for August was characteristic of the season. The small wind movement, together with the high temperature and humidity combined, gave more than the usual number of sultry and oppressive days.

The mean barometer was nearly normal and the range unusually small. The fluctuations in pressure were slow and small; the chart record showing great uniformity for the whole month. The total wind movement was but slightly more than two-thirds the August normal: the record for the last week being especially small. Much of the wind was from the southeast which is an unusual direction at this station.

The mean temperature for the month was nearly a degree and a half above the normal and the range rather large. The daily maximum was above ninety on several dates. The mean dew point, relative humidity and amount of cloudiness were all slightly above the normal.

The precipitation was slightly above the average, over half the total falling between the 15th and 17th. The rainfall the last third of the month was very light.

Corn has made good progress and an excellent crop is assured. Potatoes are proving a better crop than was expected. Much of the tobacco crop is already harvested and the best yield in a number of years is reported. The rowen crop is lighter than was expected, much of it being already harvested. Nearly all kinds of fall fruits are plentiful and of a good grade.

J. E. OSTRANDER,
Meteorologist.

A. C. MONAHAN,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 141. SEPTEMBER, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.06, 1st, 9 P.
Minimum reduced to freezing,	29.04, 12th, 10 A.
Reduced† maximum reading,	30.35, 1st, 9 P.
Reduced† minimum reading,	29.32, 12th, 10 A.
Mean tri-daily reduced,	30.035
Monthly range,	1.03

****Air Temperature.*** In Degrees Fahr.

Highest,	89.0, 6th, 3 P.
Lowest,	35.5, 19th, 6 A.
Mean hourly,	63.8
Mean of means of max. and min.,	64.5
Mean sensible (wet bulb),	58.7
Monthly range,	53.5
Highest mean daily,	75.0, 3rd
Lowest mean daily,	50.5, 19th
Mean maximum,	76.8
Mean minimum,	52.2
Mean daily range,	24.6
Greatest daily range,	37.5, 14th
Least daily range,	9.0, 16th

Humidity.

Mean dew point,	54.7
Mean force of vapor,	.646
Mean relative humidity,	73.1

Precipitation. In inches.

Total precipitation,	3.67
Number of days on which .01 inch or more rain or melted snow fell,	8

Wind.

Total movement,	3042m.
Greatest daily movement,	359 m., 12th
Least daily movement,	21m., 30th
Mean daily movement,	101.4 m
Mean hourly velocity,	4.2 m.
Maximum pressure per square foot, 17.0 lbs.= 60 m. per hour, 12th, 11 A., S.W.	
Prevailing Direction, South.	

Summary.

Southeast,	10 per cent.
North,	10 " "
South, Southeast,	20 " "
South,	20 " "
Northwest,	10 " "
Other directions,	30 " "

Weather.

Mean cloudiness observed,	54 per cent.
Total cloudiness recorded by the Sun Thermometer, 198 hrs.=53 per cent.	
Number of clear days,	4
Number of fair days,	12
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded, . . . 177 hrs.=47%

Rain, 6th, 16th, 17th, 18th, 20th, 21st, 22d, 26th, 29th, 30th.

Thunder and Lightning, 16th, 21st, 26th.

Frost on Low Lands, 15th, 19th.

Gales, 35 miles or more per hour, 60m., 12th, S. W.; 35m., 17th, N. W.; 41m., 18th, N.NW.; 35m., 24th, N.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.35	30.25	30.325	83.0	4 P	57.5	6 A	70.2	70.0	62.8	11
2	30.34	30.16	30.242	85.5	3 P	58.5	3 A	72.0	71.6	68.2	5
3	30.19	30.01	30.109	88.5	3 P	67.0	3 A	77.7	75.0	69.7	9
4	30.19	30.06	30.128	85.0	3 P	59.0	12 P	72.0	71.6	65.0	5
5	30.23	30.01	30.123	84.5	5 P	51.5	6 A	68.0	69.0	61.8	12
6	30.01	29.76	29.859	89.0	3 P	65.5	5 A	77.3	74.1	69.3	4
7	30.17	29.86	30.041	83.0	5 P	63.0	12 P	73.0	71.0	61.2	7
8	30.22	30.08	30.154	79.5	3 P	57.5	6 A	68.5	67.7	61.7	6
9	30.08	30.00	30.045	86.5	3 P	60.5	6 A	73.5	70.7	63.3	9
10	30.16	30.06	30.110	82.0	4 P	55.0	6 A	68.5	68.3	61.7	10
11	30.07	29.66	29.884	83.0	4 P	63.0	3 A	73.0	71.6	69.0	3
12	29.76	29.32	29.536	87.0	11:30 P	62.0	12 P	74.5	72.6	61.3	5
13	29.94	29.76	29.875	71.5	1:30 P	46.5	12 P	59.0	59.6	53.3	4
14	30.10	29.92	29.985	80.5	1 P	43.0	6 A	61.8	62.1	53.8	4
15	30.20	30.01	30.108	76.5	3 P	40.5	5 A	58.5	60.3	53.3	7
16	30.01	29.64	29.747	62.0	3 P	53.0	6 A	57.5	57.8	56.5	0
17	29.73	29.57	29.679	69.0	3 P	49.0	12 P	59.0	56.0	53.3	4
18	30.15	29.64	29.897	66.0	3 P	46.0	12 P	56.0	54.7	48.5	8
19	30.31	30.15	30.297	66.5	3 P	35.5	6 A	51.0	50.5	42.7	12
20	30.30	30.08	30.205	63.5	3 P	38.5	5 A	51.0	53.6	52.0	4
21	30.08	29.89	29.969	75.0	3 P	56.5	6 A	65.7	63.8	62.2	6
22	29.97	29.89	29.932	69.0	3 P	48.5	6 A	58.7	58.8	54.3	4
23	29.92	29.83	29.883	69.0	4 P	47.0	3 A	58.0	57.3	54.2	4
24	30.20	29.92	30.067	76.0	2:30 P	45.0	6 A	60.5	59.8	54.5	8
25	30.31	30.20	30.269	76.0	3:30 P	43.0	6 A	59.5	56.8	52.5	6
26	30.24	30.06	30.137	82.5	4 P	47.0	1 A	64.7	63.8	59.3	9
27	30.07	30.00	30.033	77.5	4 P	55.0	6 A	66.3	65.5	62.5	5
28	30.29	30.06	30.209	65.5	1 P	52.0	12 P	58.7	60.7	58.2	1
29	30.24	30.00	30.094	66.0	2:30 P	44.0	4 A	55.0	55.8	55.2	3
30	30.18	30.00	30.104	75.5	3:30 P	56.0	4 A	65.7	62.5	61.2	3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	58.7	.745	69.7	N.W.	76	1.0	14	10 A				
2	65.3	.849	77.7	S.S.E.	88	1.5	17	4 P				
3	67.0	.930	76.0	S.	164	2.0	20	3 P				
4	61.3	.775	76.3	N.W.	90	1.0	14	8 A				
5	56.3	.783	64.0	S.	43	0.5	10	3 P				
6	66.3	.912	75.3	S.	166	2.0	20	1 P	3:45 P	5 P	T	
7	60.0	.758	70.0	N.N.E.	116	2.5	22	9 A				
8	57.0	.715	68.7	S.S.W.	71	0.5	10	8 P				
9	58.0	.783	70.3	N.E.	73	0.0	—					
10	56.7	.750	64.7	S.E.	41	0.0	—					
11	67.0	.856	69.7	S.	157	2.0	20	2 P				
12	53.7	.816	56.0	S.W.	359	17.0	60	11 A				
13	48.3	.527	69.3	N.	81	2.0	20	2 P				
14	45.3	.622	57.3	W.S.W.	72	2.0	20	12 M				
15	53.3	.572	76.7	S.S.E.	77	0.5	10	12 M				
16	54.7	.493	88.0	N.	120	1.0	14	11 A	1 A	9 A	1.85	
17	49.0	.493	76.7	N.N.W.	79	6.0	35	4 P	3:30 P	12 P	.72	
18	41.3	.452	62.0	N.N.W.	256	8.5	41	10 A	0 A	3 A	.13	
19	31.0	.387	61.3	S.E.	51	0.5	10	1 P				
20	49.7	.450	82.0	S.S.E.	140	3.0	24	11 A	12 M	12 P	.11	
21	60.7	.602	90.0	S.S.E.	173	2.0	20	8 P	0 A	8:30 P	.46	
22	51.0	.503	76.0	W.	82	2.5	22	4 P	3 P		T	
23	51.0	.501	73.7	S.	46	0.5	10	6 P				
24	49.0	.573	68.0	N.	111	6.0	35	12 M				
25	48.3	.514	78.3	N.W.	23	0.5	10	9 P				
26	54.3	.695	66.3	S.S.E.	32	0.5	10	6 A	10:30 P	12 P	.05	
27	59.0	.690	75.7	S.E.	119	0.5	10	2 P				
28	55.3	.548	82.3	E.S.E.	83	0.5	10	8 A				
29	53.0	.484	85.3	.S.SE.	32	0.5	10	8 P	7 P	12 P	.33	
30	59.0	.611	85.7	S.	21	0.0	—		0 A	2 A	.02	

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The continuation of the droughty weather of the latter part of August well into September was easily the most noticeable feature of the month. But .16 inches rain fell from August 17th to September 16th, a period of 29 days. During the last eighteen days of the above period no measurable precipitation was noted. On the morning of the 16th the drought was broken by a heavy rainfall of nearly two inches and by the 22d about three and a quarter inches had been recorded. During the remainder of the month a few light rains brought the precipitation nearly up to the September normal.

On the 12th a heavy wind, evidently a remnant of the Galveston storm, did considerable damage to the fruit crop. While perhaps fifty per cent of the fruit was blown off the trees more than an average yield may yet be secured. This severe wind occurring during the latter part of the drought when the roads were thickly covered with dust caused a sand storm, resulting in an unusually disagreeable day. The maximum wind velocity was 60 miles per hour.

On the 26th one of the most severe thunder storms of the year was noted. With but little wind and almost no rain the heavy lightning was unusual. Fortunately no damage resulted.

The mean temperature for the month was nearly 3 degrees above the normal and the range was slightly below the average. The total wind movement was unusually low notwithstanding the storm of the 12th.

Other departures from mean conditions were generally small and unimportant.

J. E. OSTRANDER, Meteorologist.

C. L. RICE, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 142. OCTOBER, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.21, 31st, 10 A.
Minimum reduced to freezing,	29.14, 16th, 3 P.
Reduced† maximum reading,	30.52, 31st, 10 P.
Reduced† minimum reading,	29.42, 16th, 3 P.
Mean tri-daily reduced,	30.151
Monthly range,	1.07

****Air Temperature.*** In Degrees Fahr.

Highest,	83.0, 5th, 2:30 P.
Lowest,	22.0, 20th, 6 A.
Mean hourly,	54.5
Mean of means of max. and min.,	55.4
Mean sensible (wet bulb),	51.5
Monthly range,	61.0
Highest mean daily,	67.9, 5th
Lowest mean daily,	38.8, 20th
Mean maximum,	65.7
Mean minimum,	45.1
Mean daily range,	20.6
Greatest daily range,	38.0, 21st
Least daily range,	3.0, 27th

Humidity.

Mean dew point,	47.1
Mean force of vapor,	.465
Mean relative humidity,	77.0

Precipitation. In inches.

Total precipitation,	3.72
Number of days on which .01 inch or more rain or melted snow fell,	12

Wind.

Total movement,	3315m.
Greatest daily movement,	283 m., 17th
Least daily movement,	13m., 13th
Mean daily movement,	106.9 m.
Mean hourly velocity,	4.5 m.
Maximum pressure per square foot, 10 lbs.= 45 m. per hour, 16th, 3 P., S.W.	

Prevailing Direction, North, Northeast.

Summary.

Southeast,	10 per cent.
North,	10 " "
Northwest,	10 " "
Northeast,	16 " "
West,	10 " "
South,	10 " "
Other directions,	34 " "

Weather.

Mean cloudiness observed,	64 per cent.
Total cloudiness recorded by the Sun Thermometer,	205 hrs.=60 per cent.
Number of clear days,	4
Number of fair days,	12
Number of cloudy days,	15

Bright Sunshine.

Number of hours recorded, 136 hrs.=40%

Rain, 7th, 8th, 9th, 10th, 11th, 14th, 16th, 18th, 23d, 24th. 27th, 28th, 30th.

Frost on Low Lands, 12th.

Heavy Frost, 17th, 18th, 19th, 20th.

Gales, 35 miles or more per hour, 45m., 16th, S. W.; 36m., 17th, N. N. W.; 37m., 18th, W.NW.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.40	30.18	30.331	72.5	1:30 P	55.5	12 P	64.0	62.8	60.7	7
2	30.48	30.40	30.468	70.0	4 P	50.0	6 A	60.0	59.1	55.3	3
3	30.44	30.31	30.360	72.5	4:30 P	51.0	6 A	61.7	59.3	57.2	8
4	30.30	30.10	30.184	76.5	3 P	54.5	0 A	65.5	62.8	61.8	4
5	30.10	29.97	30.026	83.0	2:30 P	58.0	6 A	70.5	67.9	65.8	8
6	30.27	30.03	30.183	67.5	2 P	52.5	12 P	60.0	59.3	58.7	0
7	30.29	30.12	30.214	61.0	9 P	51.0	6 A	56.0	56.9	57.0	0
8	30.12	29.93	30.022	75.0	2:30 P	58.0	12 P	66.5	64.3	63.5	1
9	30.18	30.10	30.168	58.0	0 A	48.0	9 P	53.0	51.3	48.3	0
10	30.12	29.94	30.029	51.5	2:30 P	46.0	9 P	48.7	48.1	46.8	0
11	29 94	29.77	29.824	66.0	3 P	44.0	2 A	55.0	53.9	47.5	7
12	30.03	29.85	29.975	75.5	3 P	41.5	6 A	58.5	56.4	54.0	8
13	30.13	30.03	30.110	65.0	2 P	42.5	6:30 A	53.7	55.4	54.0	2
14	30.09	29.88	29.929	60.0	1:30 P	53.5	5 A	56 7	56.3	55.3	0
15	29.97	29.92	29.950	74.0	3 P	47.0	12 P	60.5	58.2	54.3	7
16	29.95	29.42	29.759	75.0	2 P	40.0	5:30 A	57.5	52.8	50.3	11
17	30.17	29.90	30.143	50.5	3 P	32.5	6 A	41.5	42.0	35.5	11
18	30.07	29.81	29.889	59.0	4 P	29.0	3 A	44.0	47.7	44.0	4
19	30.26	29.92	30.139	51.0	3 P	30.0	12 P	40.5	40.8	32.5	9
20	30.33	30.26	30.299	55.0	3 P	22.0	6 A	38.5	38.8	34.0	11
21	30.27	30.10	30.169	68.0	3 P	30.0	6 A	49.0	49.0	44.8	6
22	30.23	30.13	30.178	75.0	3 P	44.5	6 A	59.7	58.6	54.5	5
23	30.30	30.23	30.254	76.5	3 P	55.0	7:30 A	65.7	64.0	59.3	2
24	30.35	30.17	30.266	75.0	2:30 P	50.0	12 P	62.5	62.4	58.0	5
25	30.51	30.35	30.461	71.0	1:30 P	38.0	12 P	54.5	55.0	52.7	10
26	30.48	30.21	30.340	55.0	8 P	36.0	2 A	45.5	47.3	48.5	0
27	30.18	30.14	30.154	57.0	3 P	54.0	3 A	55.5	55.0	54.8	0
28	30.24	30.13	30.180	56.5	3 P	52.0	4 A	54.2	53.6	52.7	0
29	30.13	29.91	30.035	67.0	4 P	48.0	12 P	57.5	55.0	46.0	6
30	30.40	29.99	30.169	58.5	1 P	43.0	3 A	50.7	49.9	47.7	0
31	30.52	30.40	30.484	50.5	4:30 P	40.0	6 A	45.2	44.9	40.3	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	58.0	.620	69.7	N.E.	78	0.5	10	8 P				
2	52.7	.506	83.3	N.E.	103	0.0	—					
3	54.3	.538	82.0	W.	54	0.5	10	2 P				
4	60.0	.636	84.7	S.E.	39	0.5	10	2 P				
5	53.7	.764	82.7	S.E.	59	0.0	—					
6	56.7	.552	85.3	N.E.	80	0.5	10	4 P				
7	56.0	.490	92.3	N.N.W.	27	0.0	—		4 P	12 P	.01	
8	55.3	.635	75.0	N.E.	55	0.5	10	3 P	0 A	12 P	.70	
9	47.3	.353	93.3	N.N.W.	226	2.5	22	12 M	0 A	9 P	.48	
10	45.3	.339	90.7	N.	221	2.0	20	10 A	6 A	12 P	.48	
11	39.3	.455	57.0	N.W.	231	5.5	33	1 P	0 A	8 A	.11	
12	44.3	.513	66.3	W.	39	0.5	10	0 A				
13	51.3	.494	80.7	N.E.	13	0.0	—					
14	54.0	.471	89.3	N.	143	1.5	17	6 A	2 A	9 P	.48	
15	50.3	.531	77.0	E.	81	2.0	20	3 P				
16	46.7	.480	76.0	W.	116	10.0	45	3 P	3 P	9 P	.09	
17	25.3	.267	53.7	N.W.	283	6.5	36	1 A				
18	38.7	.349	71.7	W.N.W.	165	7.0	37	9 A	8 P	9:30 P	.08	
19	23.0	.241	57.0	N.W.	197	4.0	28	8 A				
20	25.3	.257	62.3	E.S.E.	35	0.5	10	9 P				
21	38.7	.406	68.7	S.	112	0.5	10	2 P				
22	49.7	.562	69.3	S.E.	103	0.0	—					
23	55.7	.620	76.7	S.	128	2.0	20	11 P	11 P	12 P	.04	
24	54.3	.588	76.7	S.W.	124	1.5	17	3 P	0 A	3 A	.30	
25	41.7	.478	65.7	E.	101	0.5	10	10 A				
26	47.0	.498	91.3	S.	43	0.0	—					
27	54.0	.437	96.3	N.N.E.	47	0.0	—		5 A	12 P	.93	
28	51.0	.427	88.3	N.	121	0.0	—		0 A	8 A	.02	
29	44.7	.427	76.0	N.N.W.	61	0.0	—					
30	44.3	.372	79.7	N.N.E.	82	.05	10	2 P	9 A		T.	
31	34.7	.295	68.7	E.N.E.	148	.05	10	12 M				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The departures from normal conditions in a number of the weather elements were unusually pronounced for the month. The generally high temperature was undoubtedly the most noticeable feature of all.

A comparison of the means for the month with the October normals shows a number of interesting characteristics. The barometer was generally high throughout the month giving the lightest October mean on our records. This was more than a tenth of an inch higher than the October normal of the past eleven years. The range for the month was normal.

The total wind movement was unusually small, being about four-fifths the usual amount, and scarcely any gales were noted. The prevailing direction of the wind was nearly opposite to the usual prevailing direction here.

The mean temperature was more than five degrees above the normal, making the warmest October on our records. The range while very large was less than for October 1891 and 1897. The mean dew point and relative humidity were both unusually high, and a large amount of cloudiness was noted.

The precipitation for the month was a little less than the average, the deficiency being about a quarter of an inch.

J. E. OSTRANDER, Meteorologist.

C. L. RICE, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 143. NOVEMBER, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.34, 17th, 7 A.
Minimum reduced to freezing, 28.63, 9th, 12 M.
Reduced† maximum reading, 30.64, 17th, 7 A.
Reduced† minimum reading, 28.93, 9th, 12 M.
Mean tri-daily reduced, ... 29.992
Monthly range, ... 1.71

****Air Temperature.*** In Degrees Fahr.

Highest, ... 67.0, 2nd, 1 P.
Lowest, ... 12.0, 17th, 5 A.
Mean hourly, ... 41.3
Mean of means of max. and min., ... 40.8
Mean sensible (wet bulb), ... 37.9
Monthly range. 55.0
Highest mean daily, ... 59.2, 2nd
Lowest mean daily, ... 25.4, 16th
Mean maximum, ... 48.9
Mean minimum, ... 32.8
Mean daily range, ... 16.1
Greatest daily range, ... 33.0, 7th
Least daily range, ... 5.0, 25th, 26th

Humidity.

Mean dew point, ... 32.0
Mean force of vapor, ...276
Mean relative humidity, ... 75.9

Precipitation. In inches.

Total precipitation. 5.87
Number of days on which .01 inch or more rain or melted snow fell, ... 17
Snow, Total in inches, ... 1.5

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 4877m.
Greatest daily movement, ... 404 m., 10th
Least daily movement, ... 1m., 29th
Mean daily movement, ... 162.6 m.
Mean hourly velocity, ... 6.8 m.
Maximum pressure per square foot, 18 lbs.= 60 m. per hour, 10th, 2 A., N.N.W.
Prevailing Direction, West, Southwest.

Summary.

North, ... 17 per cent.
Southwest, ... 17 " "
West, ... 13 " "
South, Southwest, ... 10 " "
Other directions, ... 43 " "

Weather.

Mean cloudiness observed, ... 72 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 207.5 hrs.=71 per cent.
Number of clear days, ... 1
Number of fair days, ... 11
Number of cloudy days, ... 18

Bright Sunshine.

Number of hours recorded, . . . 85.5 hrs.=29%
Rain, 1st, 7th, 8th, 9th, 15th, 17th, 18th, 19th, 20th, 21st, 23d, 24th, 25th, 26th, 27th, 29th, 30th.
Snow, 9th, 15th, 24th, 27th, 29th, 30th.
Gales, 35 miles or more per hour, 58m., 9th, N.N.W.; 60m., 10th, N.N.W.; 36m., 12th, S.W.; 40m., 15th, W.; 53m., 21st, W.; 47m., 22d, W.N.W.; 39m., 23d, W.S.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.43	30.13	30.251	64.0	3 P	43.0	3 A	53.5	53.5	51.5	1
2	30.29	30.11	30.184	67.0	1 P	44.0	12 P	55.5	59.2	51.3	7
3	30.31	30.17	30.249	50.0	3 P	34.0	6 A	42.0	42.8	40.2	0
4	30.17	29.84	29.996	59.0	3 P	34.0	6:30 A	46.5	44.4	40.8	4
5	29.84	29.64	29.747	63.0	1 P	32.5	6 A	47.7	45.5	42.0	6
6	30.08	29.80	29.990	53.0	3 P	35.0	12 P	44.0	44.7	37.8	7
7	30.08	29.81	29.981	59.5	3 P	26.5	8 A	43.0	44.5	41.3	4
8	29.83	29.47	29.659	61.5	3 P	49.0	7:30 A	55.3	54.3	52.5	3
9	29.51	28.93	29.185	55.0	6:30 A	35.0	8 P	45.0	43.8	39.0	2
10	30.07	29.50	29.888	43.0	3 P	33.0	12 P	38.0	38.5	32.8	5
11	30.17	30.03	30.114	48.5	1 P	30.0	6 A	39.3	39.0	35.5	3
12	30.03	29.63	29.777	47.0	3 P	35.0	8 A	41.0	40.7	35.8	4
13	29.68	29.50	29.622	48.0	3 P	37.0	4:30 A	42.5	42.9	37.5	4
14	30.06	29.48	29.895	44.0	1 P	25.0	12 P	34 5	35.0	27.5	5
15	30.18	29.98	30.074	34.0	8:30 P	25.0	0 A	29.5	29.9	27.8	0
16	30.59	30.18	30.491	33.0	3 P	18.0	12 P	25.5	25.4	23.0	9½
17	30.64	30.31	30.512	39.0	1 P	12.0	5 A	25.5	27.9	26.1	2
18	30.32	30.03	30.097	55.0	3 P	34.0	0 A	44.5	46.8	43.3	3
19	30.31	30.05	30.231	53.0	3 A	38.0	12 P	45.5	45.9	44.2	0
20	30.21	29.96	30.061	49.0	6 P	37.0	3 A	43.0	43.5	44.7	0
21	29.96	29.39	29.609	65.0	3:30 P	47.0	0 A	56.0	57.1	54.5	0
22	30.05	29.76	29.967	54.0	3 P	39.5	6 A	46.7	47.0	40.5	5
23	30.23	29.78	29.989	54.0	4 P	35.0	12 P	44.5	47.9	41.3	5
24	30.41	30.23	30.384	43.0	1 P	31.5	12 P	37.3	37.7	32.7	1
25	30.30	30.00	30.059	36.5	2:30 P	31.5	1 A	34.0	34.4	34.5	0
26	30.00	29.51	29.631	39.0	3 P	34.0	0 A	36.5	36.8	36.7	0
27	29.89	29.51	29.701	40.0	1 P	34.0	12 P	37.0	36.7	34.8	0
28	30.29	29.89	30.191	37.0	3 P	23.0	12 P	30.0	29.1	24.7	5
29	30.29	30.04	30.159	33.0	12 P	20.5	2 A	26.7	28.8	28.8	0
30	30.14	30.02	30.066	39.0	3 P	31.0	7:30 A	35.0	34.7	33.7	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	48.3	.441	80.3	S.	86	0.5	10	7 P	5 P	12 P	.03	
2	45.7	.486	68.7	S.W.	168	2.0	20	2:30 P				
3	38.7	.267	89.0	N.	40	0.5	10	12 M				
4	37.0	.304	79.7	S.S.E.	34	0.0	—					
5	36.7	.343	70.7	S.W.	70	1.5	17	2:30 P				
6	30.0	.288	62.0	W.	181	5.5	33	9 A				
7	37.3	.333	77.5	S.S.E.	139	4.0	28	3 P	10:30 P	12 P	.31	
8	50.3	.438	85.7	S.E.	126	2.0	20	0 A	0 A	6 A	.79	
9	33.3	.273	75.0	W.	214	17.0	58	10 P	2 A	2 P	.96	T.
10	22.7	.232	54.0	W.S.W.	404	18.0	60	2 A				
11	29.7	.239	71.0	S.S.W.	80	1.0	14	2 P				
12	29.3	.248	70.0	S.S.W.	83	6.5	36	12 P				
13	30.0	.272	62.3	S.W.	190	2.0	20	4 P				
14	19.3	.175	65.3	W.	213	5.5	33	11 A				
15	25.3	.162	85.7	S.W.	145	8.0	40	9 P	10 A	8 P	.01	0.5
16	16.7	.139	72.0	W.N.W.	201	3.0	24	1 A				
17	20.3	.166	74.0	S.S.W.	74	1.0	14	5 P	8 P	12 P	.06	
18	37.0	.347	66.0	S.	280	4.0	28	2 P	0 A	10 A	.04	
19	43.0	.304	94.0	E.S.E.	168	1.5	17	10 A	1 P	12 P	.25	
20	44.0	.304	96.3	N.E.	17	0.5	10	9 P	0 A	12 P	.11	
21	51.0	.486	80.3	S.W.	256	14.0	53	10 P	3 P	5 P	.01	
22	32.0	.322	58.0	W.	269	11.0	47	1 A				
23	33.3	.324	61.7	W.S.W.	284	7.5	39	10 A	0 A	2 A	.03	
24	25.3	.219	64.0	N.	86	0.5	10	7 P	7:30 P	12 P	.49	T.
25	32.7	.207	90.7	N.N.W.	162	1.5	17	8 P	0 A	12 P	.62	
26	35.7	.224	93.0	N.	253	1.0	14	7 A	0 A	12 P	1,76	
27	32.3	.209	86.3	N.N.W.	235	5.0	10	10 A	0 A	3 P	.08	T.
28	16.7	.155	67.7	N.	250	3.0	24	8 A				
29	26.7	.166	89.3	N.W.	1	0.0	—		8 A	12 P	.03	0.5
30	31.0	.203	88.0	N.	168	2.0	20	11 A	0 A	5 P	.29	0.5

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month was more disagreeable than usual for the time of the year, with cloudy and rainy days predominating. During the whole month but a single full day of sunshine was noted and but three days passed without rain during the last half of the month. Like October the month was unusually warm. The mean temperature was more than two degrees higher than the normal; the records showing the highest November mean for the past twelve years, excepting in 1896.

The mean barometer was rather low and the fluctuations of pressure large. The range was nearly half an inch more than usual and the greatest on our records for November. For but the fifth time in nearly twelve years a reduced minimum reading of less than 29 in. was noticed.

The total wind movement was somewhat more than usual; seven days having a mean velocity of over ten miles per hour for the entire day. The record of but one mile for the 29th is of passing interest.

The total precipitation was about 25 per cent greater than usual and was well distributed throughout the month, the ground thus receiving an ample supply before freezing for the winter.

Thunder and lightning was observed on several dates, though the storms were generally distant. The relative humidity and mean dew point were about the only features of the weather that were normal for the month.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 144. DECEMBER, 1900.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.19, 15th, 10 A.
Minimum reduced to freezing, 28.67, 4th, 12 P.
Reduced† maximum reading, 30.51, 15th, 10 A.
Reduced† minimum reading, 28.98, 4th, 12 P.
Mean tri-daily reduced, ... 30.026
Monthly range, ... 1.53

****Air Temperature.*** In Degrees Fahr.

Highest, ... 58.0, 24th, 3 P.
Lowest, ... 0.5, 18th, 7:30 A.
Mean hourly, ... 30.6
Mean of means of max. and min., ... 28.4
Mean sensible (wet bulb), ... 26.9
Monthly range, ... 57.5
Highest mean daily, ... 47.7, 24th
Lowest mean daily, ... 14.3, 15th
Mean maximum, ... 37.4
Mean minimum, ... 19.5
Mean daily range, ... 17.9
Greatest daily range, ... 32.5, 18th
Least daily range, ... 8.5, 31st

Humidity.

Mean dew point, ... 21.7
Mean force of vapor, ...174
Mean relative humidity, ... 74.9

Precipitation. In inches.

Total precipitation, ... 2.40
Number of days on which .01 inch or more rain or melted snow fell, ... 7
Snow, Total in inches, ... 3.0
Snow on ground at end of month, . . Trace

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 4203m.
Greatest daily movement, ... 315 m., 14th
Least daily movement, ... 9 m., 1st
Mean daily movement, ... 135.6 m.
Mean hourly velocity, ... 5.6 m.
Maximum pressure per square foot, 13 lbs.= 51 m. per hour, 9th, 10:30 A., S.S.W.
Prevailing Direction, Southwest.

Summary.

South, ... 10 per cent.
Southwest, ... 19 " "
West, Southwest, ... 10 " "
West, ... 16 " "
South, ... 10 " "
Other directions, ... 35 " "

Weather.

Mean cloudiness observed, ... 62 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 175.0 hrs.=62 per cent.
Number of clear days, ... 5
Number of fair days, ... 10
Number of cloudy days, ... 16

Bright Sunshine.

Number of hours recorded, . . 108.0 hrs.=38%

Rain, 1st, 4th, 5th, 23d, 24th, 30th, 31st.

Sleet, 30th.

Snow, 5th, 9th, 11th, 13th, 16th, 25th, 26th, 28th.

Gales, 35 miles or more per hour, 39m., 4th, E.S.E.; 51m., 9th, S.S.W.; 46m., 13th, W.N.W.; 35m., 14th, W.N.W.; 36m., 26th, N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.14	30.05	30.104	44.0	1:30 P	23.5	6 A	33.7	33.5	32.2	3
2	30.31	30.13	30.239	45.5	1 P	27.0	8 A	26.3	35.7	33.5	5
3	30.33	30.15	30.234	48.5	3 P	25.0	6 A	36.7	36.3	34.3	2
4	30.15	28.98	29.652	43.0	3 P	31.5	6 A	37.3	36.5	38.2	0
5	29.87	28.98	29.556	37.0	7:30 A	28.0	12 P	32.5	32.8	30.8	0
6	30.20	29.87	30.110	37.5	3 P	24.5	8 A	31.0	31.8	30.0	1
7	30.20	30.11	30.132	42.0	1 P	30.0	12 P	36.0	35.5	31.7	1
8	30.15	29.80	30.022	37.0	3 P	22.0	6 A	29.5	28.1	25.8	8
9	30.02	29.53	29.751	37.0	10 A	13.0	12 P	25.0	26.2	25.0	2
10	30.29	30.00	30.232	23.0	4 P	5.5	6:30 A	14.3	15.0	13.4	9
11	30.19	29.95	30.017	30.5	3 P	16.0	7:30 A	23.3	22.9	20.6	3
12	30.19	30.00	30.147	27.5	3 P	12.0	7:30 A	19.7	22.3	19.1	5
13	30.04	29.63	29.749	42.0	2:30 P	25.0	0 A	33.5	34.4	30.8	1
14	30.41	29.88	30.239	23.0	3 P	8.0	12 P	15.5	16.3	12.5	9
15	30.51	30.41	30.478	23.5	3 P	5.0	6:30 A	14.3	14.3	13.5	6
16	30.43	30.38	30.401	25.0	2:30 P	11.0	12 P	18.0	16.9	15.2	4
17	30.44	30.28	30.355	32.0	3 P	3.0	7:30 A	17.5	13.7	12.9	8
18	30.29	30.05	30.193	33.0	3 P	0.5	7:30 A	16.7	18.0	17.0	8
19	30.07	29.98	30.027	44.5	12 M	28.0	0 A	36.3	37.5	34.3	1
20	30.03	29.90	29.952	43.0	12 M	23.0	7 A	33.0	33.2	29.8	3
21	30.03	29.86	29.938	31.5	4 P	22.5	9 A	27.0	28.1	25.2	0
22	30.17	29.89	30.061	45.5	3 P	18.5	7:30 A	32.0	31.5	28.7	4
23	30.16	29.88	30.048	50.0	11 P	24.0	5 A	37.0	39.8	40.0	1
24	29.88	29.77	29.808	58.0	3 P	35.0	12 P	46.5	47.7	46.8	3
25	29.84	29.73	29.788	44.5	3 P	24.0	8 A	34.3	34.6	31.8	5
26	30.06	29.80	29.913	34.0	3 P	22.0	12 P	28.0	30.0	25.7	2
27	30.23	30.06	30.191	34.0	3 P	18.5	3 A	26.3	25.2	24.2	4
28	30.19	29.75	29.873	31.5	9:30 P	20.0	1 A	25.7	27.4	27.7	0
29	30.00	29.85	29.960	33.0	3 P	14.0	6:30 A	23.5	24.7	21.0	6
30	30.02	29.76	29.891	40.0	3 P	14.0	4:30 A	27.0	28.8	27.3	4
31	28.91	29.68	29.758	40.0	12 P	31.5	6 A	35.5	35.2	35.5	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	28.3	.208	80.3	S.	9	0.5	10	2 P	5:30 P		T.	
2	29.3	.217	80.0	N.N.E.	21	0.5	10	7 A				
3	29.0	.235	74.7	S.S.E.	60	0.5	10	9 P				
4	37.3	.238	95.7	E.	137	7.5	39	2 P	8 A	12 P	1.14	
5	28.7	.181	88.7	N.N.W.	205	5.0	32	1 A	0 A	4 P	.08	0.5
6	25.3	.185	78.0	W.	40	0.5	10	12 M				
7	26.0	.204	71.3	S.	85	0.5	10	2 P				
8	21.7	.157	78.7	S.W.	41	0.5	10	12 P				
9	18.0	.151	71.7	W.S.W.	297	13.0	51	10:30 A	7 A	.		T.
10	5.0	.094	63.7	W.	207	4.5	30	11 A				
11	15.7	.125	75.7	S.W.	62	2.0	20	11 P	2 P	5 P		T.
12	12.7	.119	69.7	W.S.W.	165	3.0	24	8 P				
13	20.0	.209	55.0	W.S.W.	237	10.5	46	9 P	6:30 P			T.
14	2.0	.091	55.7	W.N.W.	315	6.0	35	8 A				
15	7.3	.094	71.0	N.W.	200	1.0	14	8 A				
16	8.0	.099	70.3	N.	240	5.5	33	8 P	3 A	8 A	T.	0.5
17	8.7	.094	79.3	N.N.W.	168	1.5	17	3 P				
18	10.7	.118	73.3	S.W.	22	0.5	10	11 P				
19	28.0	.231	67.7	S.S.W.	187	5.0	32	1 P				
20	24.7	.192	72.7	S.W.	123	3.5	26	5 P				
21	19.0	.152	70.7	W.	160	2.0	20	6 P				
22	23.3	.190	72.7	S.E.	91	0.5	10	7 P				
23	37.7	.269	87.0	S.	226	4.0	28	10 A	8 P	12 P	.12	
24	45.0	.349	88.7	E.S.E.	67	0.5	10	1 A	0 A	6 A	.68	
25	26.0	.212	69.7	S.W.	48	1.0	14	9 P	9 P	10 P		T.
26	18.0	.163	64.0	W.	194	6.5	36	5 P	9 A	10 A		T.
27	19.0	.146	72.0	W.N.W	125	2.5	22	8 A				
28	24.3	.161	84.0	S.S.E.	89	2.0	20	10 P	3 A	5 P	.10	2.0
29	14.7	.130	70.7	S.W.	136	2.5	22	1 P				
30	22.3	.176	76.0	S.S.E	213	3.0	24	5 P	8 P	12 P	.15	
31	34.3	.213	93.7	W.	33	2.0	20	11 P	6 A	6 P	.13	

*Rain or melted snow at base of tower. **Included in following day.

Annual Summary for 1900.

Pressure. In inches.

Maximum reduced to freezing, ... 30.42, Feb. 28th, 7 A.
Minimum reduced to freezing, ... 28.55, Feb. 25th, 4 A.
Maximum reduced to freezing and sea-level, ... 30.75, Feb. 28th, 7 A.
Minimum reduced to freezing and sea-level, ... 28.86, Feb. 25th, 4 A.
Mean reduced to freezing and sea-level, ... 29.985
Annual range, ... 1.89

***Air Temperature.** In degrees Fahr.

Highest, ... 96.0, Aug. 6th, 5:30 P.
Lowest, ... —8.0, Feb. 3rd, 6:30 A.
Mean, ... 48.3
Mean of means of max. and min., ... 48.1
Mean sensible (wet bulb) 45.0
Annual range, ... 104.0
Highest mean daily, ... 84.0, July 17th.
Lowest mean daily, ... 3.4, Feb. 2d.
Mean maximum, ... 59.1
Mean minimum, ... 37.3
Mean daily range, ... 21.8
Greatest daily range, ... 47.5, May 27th.
Least daily range, ... 2.5 May 19th.

Humidity.

Mean dew point, ... 39.2
Mean force of vapor, ...436
Mean relative humidity, ... 72.3

Wind.

Prevailing direction, ... West.

Summary.

Northwest, ... 15 per cent.
North, ... 12 " "
Southwest, ... 11 " "
South, ... 10 " "
West, ... 10 " "
Other directions, ... 42 " "
Total movement, ... 50503 m.
Greatest daily movement, . . . 435 m., Feb. 26th.
Least daily movement, ... 1 m., Nov. 29th.
Mean daily movement, ... 138.4 m.
Mean hourly velocity, ... 5.8 m.
Maximum pressure per square foot, 30.5 lbs.=78 m. per hour, Feb. 25th, 11:00 P., W.N.W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 51.67
Number of days on which .01 or more rain or melted snow fell, ... 131
Snow total in inches, ... 37.0

Weather.

Mean cloudiness observed, ... 55 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2238=50 per cent.
Number of clear days, ... 83
Number of fair days, ... 144
Number of cloudy days, ... 138

Bright Sunshine.

Number of hours recorded, . . 2216=50 per cent

Dates of Frosts.

Last, ... May 29th.
First, ... Sept. 15th.

Dates of Snow.

Last, ... Apr. 9th.
First, ... Nov. 9th.
Total days of sleighing, ... 27

Gales of 50 or More Miles Per Hour.

Jan. 64 m., 26th, N.W.; 55 m., 27th, N.W.
Feb. 53 m., 5th, N.; 55m., 13th, N.W.; 50 m., 14th, N.W., 52 m., 22d, N.E.; 78 m., 25th, W.N.W.; 51 m., 26th, N.W.
Mar. 57 m., 2nd, N.W.; 53 m., 4th, N.W.
Apr. 50 m., 1st, W.N.W.; 51 m., 26th, N.N.E.
May. 52 m., 1st, N.W., 66 m., 5th, N.W.
June. 50 m., 30th, N.W.
July. 68 m., 7th, S.W.
Aug. 57 m., 6th, N.N.W.
Sept. 60 m.. 12th, S.W.
Nov. 58 m.. 9th, N.N.W.; 60 m., 10th, N.N.W.
Dec. 51 m., 9th, S.S.W.

*Temperature in ground shelter.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 145. JANUARY, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.36, 3d, 10 A. 20th, 9 A.
Minimum reduced to freezing, 28.69, 28th, 1 A.
Reduced† maximum reading, 30.69, 3d, 10 A. 20th, 9 A.
Reduced† minimum reading, 29.01, 28th, 1 A.
Mean tri-daily reduced, ... 29.953
Monthly range, ... 1.68

****Air Temperature.*** In Degrees Fahr.

Highest, ... 47.0, 9th, 3:30 P.
Lowest, ... —8, 20th, 6 A.
Mean hourly, ... 23.7
Mean of means of max. and min., ... 23.6
Mean sensible (wet bulb), ... 22.1
Monthly range, ... 55.0
Highest mean daily, ... 37.0, 16th
Lowest mean daily, ... 2.5, 19th
Mean maximum, ... 32.7
Mean minimum, ... 14.5
Mean daily range, ... 18.2
Greatest daily range, ... 34.0, 20th
Least daily range, ... 7.0, 10th, 12th

Humidity.

Mean dew point, ... 16.6
Mean force of vapor, ...141
Mean relative humidity, ... 74.3

Precipitation. In inches.

Total precipitation, ... 1.81
Number of days on which .01 inch or more rain or melted snow fell, ... 10
Snow, Total in inches, ... 12.0
Snow on ground at end of month, ... 2.0

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 5224m.
Greatest daily movement, ... 460 m., 26th
Least daily movement, ... 27 m., 14th
Mean daily movement, ... 168.5 m.
Mean hourly velocity, ... 7.0 m.
Maximum pressure per square foot, 12.5 lbs.= 49 m. per hour, 19th, 2 P., N.W.
Prevailing Direction, West.

Summary.

North, Northwest, ... 23 per cent.
Northwest, ... 13 " "
West, ... 13 " "
South, ... 13 " "
South, Southwest, ... 10 " "
North, ... 10 " "
Other directions, ... 18 " "

Weather.

Mean cloudiness observed, ... 58 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 177 hrs.=60 per cent.
Number of clear days, ... 6
Number of fair days, ... 9
Number of cloudy days, ... 16

Bright Sunshine.

Number of hours recorded, . . 117 hrs.=40%
Rain, 9th, 10th, 16th, 21st, 23d.
Sleet, 10th.
Snow, 2d, 7th, 10th, 11th, 12th, 14th, 15th, 16th, 17th, 18th, 19th, 28th, 30th, 31st.
Gales, 35 miles or more per hour, 35m., 1st, W.N.W.; 42 m., 2d, W.; 41 m., 12th, N. W.; 49m., 19th, N.W.; 36m., 20th, S.; 46m., 26th, N.N.W.; 39m., 29th, W.
No. days sleighing, ... 19

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.42	29.91	30.264	41.0	3 A	17.0	12 P	29.0	28.8	24.3	6
2	30.46	30.34	30.380	30.5	3 P	9.5	8 A	20.0	20.1	20.0	7
3	30.69	30.42	30.647	22.0	4:30 P	3.5	7:30 A	12.7	10.0	6.8	8
4	30.59	30.04	30.221	33.0	11 P	3.5	5 A	18.3	18.8	19.1	2
5	30.34	30.05	30.289	25.5	3 P	12.0	12 P	18.7	20.4	16.0	8
6	30.33	30.16	30.248	38.0	3 P	9.0	8 A	23.5	21.3	20.3	8
7	30.16	29.90	29.989	37.0	9 P	22.0	0 A	29.5	30.8	31.0	0
8	30.30	30.09	30.242	38.5	3 P	20.0	7:30 A	29.3	28.7	26.3	7
9	30.34	29.96	30.137	47.0	3:30 P	29.0	0 A	38.0	36.4	34.5	4
10	30.39	30.08	30.238	31.0	0 A	24.0	6 A	27.5	24.1	22.5	0
11	30.10	29.80	30.010	30.0	9 P	20.0	0 A	25.0	26.6	27.2	0
12	29.72	29.58	29.598	33.0	4 P	26.0	6:30 A	29.5	29.4	28.2	1
13	30.08	29.69	29.963	29.0	3 P	6.0	12 P	17.5	21.0	19.3	7
14	30.09	29.85	29.969	27.5	9 P	−2.5	8 A	12.5	13.4	15.2	3
15	29.88	29.79	29.828	34.0	2:30 P	25.0	0 A	29.5	30.2	30.3	0
16	29.88	29 48	29.636	45.5	3 P	31.0	4 A	38.3	37.0	36.7	0
17	29.66	29.50	29.609	38.0	3 P	22.0	7:30 A	30.0	32.1	29.5	0
18	29 92	29.44	29 657	29.0	0 A	5.0	12 P	17.0	16.9	13.4	3
19	30.59	29.92	30.259	10.0	1:30 P	−4.0	10 P	3.0	2.5	1.5	3
20	30.69	30.14	30.448	26.0	12 P	−8.0	6 A	9.0	8.6	8.7	3
21	30.14	29.84	29.938	42.0	3 P	26.0	0 A	34.0	33.5	31.5	5
22	30.42	29.90	30.299	40.0	0 A	13.0	12 P	26.5	27.1	20.9	9
23	30.43	30.10	30.292	32.0	4 P	7.0	2 A	19.5	20.5	21.7	6
24	30.10	29.47	29.635	43.5	4 P	25.0	3 A	34.3	30.4	29.2	4
25	29.69	29.41	29.539	39.0	4 P	20.0	3 A	29.5	32.1	29.9	2
26	29.82	29.52	29.689	34.0	4 P	20.0	12 P	27.0	26.9	22.8	7
27	29.52	29.02	29.179	29.0	3 P	11.5	6:30 A	20.3	22.2	19.1	4
28	29.24	29 01	29.086	27.0	3 P	18.0	7:30 A	22.5	23.2	21.5	1
29	29.87	29.24	29.666	26.0	4 P	13.0	6:30 A	19.5	19.3	16.7	8
30	30.01	29.77	29.920	27.0	3 P	10.0	9 A	18.5	20.6	18.3	1
31	29.77	29.61	29.669	27.5	2 P	17.0	6 A	22.3	22.4	21.2	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches.	
											* Rain.	Snow.
1	17.0	.155	64.7	W.	202	6.0	35	10:30 A				
2	13.3	.127	69.0	S.W.	146	9.0	42	10:30 P	9 P			T.
3	0.0	.066	69.7	N.W.	233	5.5	33	7 A				
4	14.3	.123	76.7	S.S.W.	65	0.5	10	11:30 P				
5	7.3	.106	53.7	W.S.W.	181	2.5	22	11 A				
6	15.7	.132	77.0	S.	40	0.0	—	—				
7	27.7	.186	84.7	S.S.E.	96	2.5	22	12 P	10 A	2 P		T.
8	18.3	.171	62.3	W.	149	2.5	22	11 P				
9	28.7	.232	70.0	W.	266	5.0	32	10 A	1 A	5 A	.15	
10	19.7	.127	87.7	N.	186	1.5	17	4 A	8 A	8 P	.42	2.5
11	25.7	.151	94.0	N.N.W.	134	0.5	10	2 A	1 P	12 P	.65	3.0
12	25.0	.164	84.7	N.N.W.	220	8.5	41	10 P	0 A	11 A	.12	1.5
13	13.0	.121	71.3	N.W.	169	1.0	14	12 M				
14	10.3	.106	77.7	S.S.E.	27	0.0	—	—	8:45 A	12 P	.10	1.5
15	28.3	.176	89.7	N.N.W.	33	0.0	—	—	0 A	12 P	.10	1.5
16	32.7	.240	81.3	S.	142	3.5	26	2 P	6 A	4 P	.05	T.
17	25.0	.181	79.3	W.	69	1.0	14	10 P	9:30 P			T.
18	7.7	.094	72.0	W.N.W	214	5.5	33	8:30 P	7 A			T.
19	−5.3	.052	69.0	N.W.	199	12.5	49	2 P	9 A			T.
20	2.0	.082	69.3	S.	177	6.5	36	4 P				
21	26.3	.205	71.7	S.S.E.	317	3.0	24	2 P	4 P	8 P	.02	
22	10.3	.135	56.0	N.N.W.	226	4.5	30	8 A				
23	19.3	.131	90.3	N.	67	0.0	—	—	9 P	12 P	T.	
24	24.7	.176	80.3	N.N.W.	137	1.0	14	10 A				
25	23.7	.189	69.3	N.	303	8.5	41	11 P				
26	15.0	.143	63.3	N.N.W.	460	10.5	46	6 P				
27	12.0	.122	68.0	N.W.	153	2.5	22	0 A				
28	17.7	.125	80.7	W.N.W.	179	4.0	28	5 P	1 P			T.
29	9.7	.107	69.0	W.S.W.	241	7.5	39	3 P				
30	12.3	.114	73.3	S.	47	0.0	—	—	2:30 P	12 P	.04	0.5
31	16.7	.125	78.0	N.N.W.	146	2.0	20	8 A	0 A	4 P	.16	1.5

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

Good winter weather was prevalent during the whole month although the absence of snow during the early part detracted somewhat from otherwise seasonable conditions. A moderate snowfall on the 10th—12th improved matters and gave a more wintry appearance to the remainder of the month.

The mean barometric pressure was unusually low, the departure from the normal being about a tenth of an inch. The range was large resulting from a rather low minimum.

The daily records show that fluctuations of considerable magnitude were frequent throughout the whole month.

The total wind movement was between ten and fifteen per cent. more than usual, and a considerable number of moderate gales were noted. The greatest daily movement—460 miles on the 26th—is a record rarely made here. The pressure chart shows that heavy gales were wanting.

The mean temperature was normal and the range rather small. The mean dew point was nearly three degrees lower than normal.

The total precipitation was less than half the usual quantity and most of it fell as snow. Nearly the whole amount occurred on a few days near the middle of the month.

Although the precipitation was light the amount of cloudiness was considerable more than usual.

Owing to the favorable conditions prevailing an excellent crop of ice has been secured.

J. E. OSTRANDER, Meteorologist.

C. L. RICE, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 146. FEBRUARY, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.00, 3d, 7 A.
Minimum reduced to freezing,	29.05, 14th, 2 P.
Reduced† maximum reading,	30.34, 3d, 7 A.
Reduced† minimum reading,	29.37, 14th, 2 P.
Mean tri-daily reduced,	29.788
Monthly range,	0.97

****Air Temperature.*** In Degrees Fahr.

Highest,	44.0, 26th, 3 P.
Lowest,	—4.5, 3d, 6 A.
Mean hourly,	20.1
Mean of means of max. and min.,	19.2
Mean sensible (wet bulb),	17.8
Monthly range,	48.5
Highest mean daily,	31.9, 16th
Lowest mean daily,	11.2, 14th
Mean maximum,	28.0
Mean minimum,	10.4
Mean daily range,	17.6
Greatest daily range,	40.5, 3d
Least daily range,	5.0, 4th

Humidity.

Mean dew point,	10.6
Mean force of vapor,	.116
Mean relative humidity,	68.5

Precipitation. In inches.

Total precipitation,	0.62
Number of days on which .01 inch or more rain or melted snow fell,	4
Snow, Total in inches,	8.0
Snow on ground at end of month,	0.5

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5484m.
Greatest daily movement,	449 m., 13th
Least daily movement,	16 m., 3d
Mean daily movement,	195.9 m.
Mean hourly velocity,	8.2 m.
Maximum pressure per square foot, 10.5 lbs.= 46 m. per hour, 13th, 8:30 P., W.N.W.	
Prevailing Direction, West, Northwest.	

Summary.

West, Northwest,	21 per cent.
Northwest,	25 " "
West,	25 " "
Other directions,	29 " "

Weather.

Mean cloudiness observed,	45 per cent.
Total cloudiness recorded by the Sun Thermometer,	124 hrs.=42 per cent.
Number of clear days,	8
Number of fair days,	12
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded,	172 hrs.=58%
Snow, 4th, 9th, 11th, 16th, 18th, 19th, 22d, 24th, 27th.	
Gales, 35 miles or more per hour, 36m., 5th, N.W.; 38 m., 6th, N.W.; 35 m., 7th, N.; 35m., 8th, N.W.; 35m., 10th, W.N.W.; 46m., 13th, W.N.W.; 40m., 14th, W.N.W.; 35 m., 15th, N.W.; 38 m., 21st, W.N.W.; 37 m,, 25th, S.W.; 39 m., 27th, W.	
No. days sleighing,	16

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.04	29.73	29.877	28.5	3 P	4.5	5:30 A	16.5	17.9	16.5	6
2	30.31	30.04	30.229	27.0	3 P	3.5	7:30 A	15.3	15.9	12.8	6
3	30.34	30.06	30.229	36.0	2:30 P	−4.5	6 A	15.7	15.8	17.5	8
4	30.06	29.50	29.654	24.0	9 P	19.0	5 A	21.5	22.8	22.2	0
5	29.73	29.49	29.622	26.0	2 P	15.0	12 P	20.5	22.0	19.1	4
6	29.85	29.72	29.785	19.0	4 P	6.0	7:30 A	12.5	12.7	11.1	10
7	29.92	29.84	29.884	20.5	3 P	5.0	3 A	12.7	12.5	12.1	10
8	29.97	29 92	29.950	22.5	3 P	4.0	6:30 A	13.3	14.9	12.6	10
9	29.94	29.63	29.744	21.0	3 P	−1.0	6:30 A	10.0	12.3	10.7	1
10	30.12	29.65	29.967	24.0	3 P	10.0	4 A	17.0	15.8	14.4	10
11	30.19	30.01	30.115	33.0	3:30 P	8.0	4:30 A	20.5	21.0	18.6	10
12	30.01	29.57	29.763	29.0	3 P	12.0	6:30 A	20.5	22.0	18.6	2
13	29.68	29.42	29.521	15.5	1 P	5.5	5:30 A	10.5	11.6	8.9	4
14	29.49	29.37	29.427	16.0	3 P	5.5	5 A	10.7	11.2	9.5	6
15	29.52	29.38	29.478	32.0	4 P	7.0	2:30 A	19.5	22.6	21.5	5
16	29.60	29 51	29.570	41.0	3 P	25.0	1:30 A	33.0	31.9	30.0	4
17	29.62	29.51	29.607	35.5	2:30 P	23.0	12 P	29.3	29.5	26.5	3
18	29 66	29.56	29.610	36.5	12 M	22.5	7:30 A	29.5	30.0	27.5	8
19	29.63	29.49	29.544	35.0	3 P	22.0	12 P	28.5	29.0	24.8	3
20	29.58	29.40	26.479	31.5	1 P	13.0	6:30 A	22.3	22.2	19.3	6
21	29.84	29.58	29.727	21.5	3 P	12.0	9:30 A	16.7	17.2	14.4	8
22	29.90	29.75	29.825	27.5	2:30 P	6.0	6 A	16.7	19.0	16.2	5
23	30.03	29.75	29.951	26.0	3 P	2.0	6:30 A	14.0	17.9	14.2	7
24	29.87	29.60	29.712	25 0	3 P	12.5	7:30 A	18.7	18.6	15.9	9
25	29.96	29.87	29.907	38.0	3 P	10.0	5:30 A	24.0	25.7	23.3	8
26	29.86	29.62	29.729	44.0	3 P	23.0	12 P	33.5	31.3	26.5	4
27	30.07	29.77	29.945	25.5	4 P	14.0	7:30 A	19.7	21.0	15.8	5
28	30.29	30.07	30.219	24.0	3 P	7.0	6:30 A	15.5	18.0	15.2	10

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	10.0	.110	70.3	S.W.	100	1.5	17	3 P				
2	5.0	.093	66.7	W.	69	1.0	14	2 P				
3	13.0	.122	78.0	W.N.W.	16	0.0	—	—				
4	13.0	.127	82.7	N.N.W.	192	1.5	17	8 P	1 A	11 P	.55	6.0
5	13.7	.116	73.3	N.W.	359	6.5	36	11 A				
6	6.3	.079	77.7	N.W.	355	7.5	38	1 P				
7	4.0	.086	66.0	N.	277	6.0	35	1 P				
8	3.7	.090	61.0	W.	194	6.0	35	4 P				
9	4.3	.083	71.7	W.N.W.	39	0.0	—	—	11 A			T.
10	5.3	.098	61.0	N.W.	277	6.0	35	2 P				
11	10.0	.120	74.0	W.N.W.	171	2.0	20	2 P	11 P			T.
12	12.3	.116	69.3	W.	158	4.5	30	1:30 P				
13	−1.3	.075	57.3	N.W.	449	10.5	46	8:30 P				
14	1.3	.076	64.0	N.W.	400	8.0	40	0 A				
15	15.7	.132	71.0	N.W.	260	6.0	35	3 P				
16	26.3	.182	84.7	W.N.W.	179	3.0	24	1 A	10 P			T.
17	21.3	.162	71.7	N.W.	145	1.5	17	3 P				
18	23.0	.166	76.3	W.S.W.	76	3.0	24	2 P	6 A	7:30A	.03	0.5
19	17.7	.155	66.3	W.	133	4.0	28	11 A	11 A			T.
20	13.0	.120	69.0	W.N.W.	136	3.0	24	10 A				
21	6.0	.097	62.7	W.	241	7.5	38	12 M				
22	9.3	.107	67.3	S.	91	1.0	14	9 P	2 P	6 P	.03	1.0
23	6.7	.099	67.3	W.S.W.	50	1.0	14	2 P				
24	6.7	.105	60.7	W.N.W.	234	5.0	32	2 P	1 A	3 A	.01	0.5
25	16.3	.152	67.7	S.W.	195	7.0	37	2 P				
26	22.0	.175	62.7	S.S.W.	202	3.0	24	6 P				
27	5.0	.108	55.0	W.	267	7.5	39	3 P	1 P			T.
28	6.7	.103	63.0	W.	219	5.0	32	5:30 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

During the whole month with scarcely an exception agreeable winter weather prevailed. A single snowstorm and a few windy days were the only unpleasant features. Although the temperature was below freezing nearly the whole month, very little zero weather was noted.

The light precipitation was probably the most noticeable feature of the month. The total amount was only about one-fifth the normal, and only about one-half the lowest previous February record. August, 1894 is the only month on our records showing a smaller amount. The whole precipitation was in the form of snow and practically all of it fell on one date,—the 4th.

The mean temperature was fully five degrees below the normal and the range was unusually small. The maximum for the month made a new low maximum record for February while the minimum record was rather high. The mean dew point was about ten degrees below the normal and much below any previous monthly record at this station. The mean relative humidity was more than ten per cent lower than usual.

The barometer for the month made a new low mean record for February and the range was exceptionally small for the time of year. The total wind movement was about twenty per cent above the average and moderate gales were quite frequent. The direction was from the northwest quadrant nearly the whole month,—an unusual feature for so long a period.

The amount of cloudiness was less than usual as might be expected from the precipitation record.

A summary of the conditions prevailing during the month shows that while the mean records were generally low, extreme daily fluctuations were entirely wanting.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 147. MARCH, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.11, 19th, 9 P.
Minimum reduced to freezing,	28.95, 27th, 3 A.
Reduced† maximum reading,	30.43, 19th, 9 P.
Reduced† minimum reading,	29.26, 27th, 3 A.
Mean tri-daily reduced,	29.895
Monthly range,	1.17

****Air Temperature.*** In Degrees Fahr.

Highest,	56.5, 25th, 3 P.
Lowest,	—0.5, 7th, 6 A.
Mean hourly,	33.1
Mean of means of max. and min.,	32.5
Mean sensible (wet bulb),	30.8
Monthly range,	57.0
Highest mean daily,	43.9, 25th
Lowest mean daily,	9.7, 6th
Mean maximum,	40.5
Mean minimum,	24.5
Mean daily range,	16.0
Greatest daily range,	29.5, 7th
Least daily range,	3.5, 12th

Humidity.

Mean dew point,	24.7
Mean force of vapor,	.204
Mean relative humidity,	70.8

Precipitation. In inches.

Total precipitation,	5.66
Number of days on which .01 inch or more rain or melted snow fell,	12
Snow, Total in inches,	6.5
Snow on ground at end of month,	0

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5482m.
Greatest daily movement,	378 m., 29th
Least daily movement,	29 m., 16th
Mean daily movement,	176.8 m.
Mean hourly velocity,	7.4 m.

Maximum pressure per square foot, 10.5 lbs.= 46 m. per hour, 21st, 9:00 A., S.E.

Prevailing Direction, West, Northwest.

Summary.

West, Northwest,	10 per cent.
Northwest,	19 " "
Northeast,	13 " "
North,	10 " "
South,	13 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	68 per cent.
Total cloudiness recorded by the Sun Thermometer,	278 hrs.=75 per cent.
Number of clear days,	3
Number of fair days,	7
Number of cloudy days,	21

Bright Sunshine.

Number of hours recorded,	93 hrs.=25%

Rain, 2d, 4th, 8th, 9th, 10th, 11th, 20th, 21st, 24th, 25th, 26th.

Snow, 1st, 4th, 5th, 14th, 15th, 16th, 27th, 28th.

Gales, 35 miles or more per hour, 36m., 12th, N.W.; 46 m., 21st, S.E.; 36 m., 29th, N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.25	29.65	29.929	39.0	12 P	11.0	6 A	25.0	27.1	25.3	0
2	29.99	29.64	29.752	45.0	2:30 P	22.0	12 P	33.5	37.4	34.2	3
3	30.22	29.88	30.107	34.0	4 P	10.5	6 A	22.3	23.9	23.6	1
4	30.03	29.69	29.906	50.0	2:30 P	32.0	6 A	41.0	38.3	35.8	5
5	29.78	29.54	29.655	37.0	11 A	26.0	12 P	31.5	28.0	24.8	0
6	30.24	29.78	30.079	15.0	3 P	3.0	6 A	9.0	9.7	7.7	6
7	30.31	30.14	30.236	29.0	4 P	−0.5	6 A	14.3	15.9	16.1	9
8	30.21	29.95	30.117	42.5	2 P	22.0	6 A	32.3	32.5	30.8	1
9	30.06	29.79	29.858	42.0	12 M	31.0	1 A	36.5	37.6	37.8	0
10	30.39	30.06	30.323	35.0	4 P	28.0	12 P	31.5	33.1	29.8	0
11	30 18	29.38	29.566	38.0	3 P	28.0	0 A	33.0	35.0	35.7	0
12	29.88	29.43	26.706	35.5	2:30 P	32.0	12 P	33.7	33.3	29.8	1
13	30.02	29.80	29.937	40.5	2:30 P	27.0	6 A	33.7	34.1	30.3	2
14	29.83	29.73	29.794	39.0	3 P	27.5	5 A	33 3	33.1	32.0	0
15	29.80	29.73	29.777	34.0	3 P	27.5	4 A	30.7	31.1	30.7	0
16	29.99	29 78	29.889	36.0	2 P	26.0	5:30 A	31.0	32.0	29.8	0
17	30.03	29.91	29.973	39.0	3 P	16.5	6:30 A	27.7	30.1	27.2	5
18	30.10	29.91	30.016	51.0	3 P	26.0	6:30 A	38.5	40.0	35.3	8
19	30.43	29.91	30.302	38.0	0 A	26.0	12 P	32.0	31.2	26.7	4
20	30.41	30.05	30.288	36.5	3 P	20.0	6:30 A	28.3	31.2	30.0	2
21	30.05	29.62	29.701	53.0	3 P	31.0	0 A	42.0	43.6	45.7	0
22	30.06	29.79	29.916	42.0	3 P	28.5	6:30 A	35.3	35.8	32.0	6
23	30.21	30 06	30.149	52.0	5 P	24.0	5:30 A	38.0	39.1	34.5	12
24	30.16	30.06	30.087	43.5	3 P	30.0	5:30 A	36.7	38.3	37.8	0
25	30.11	30.00	30.076	56.5	3 P	37.0	5 A	46.7	43.9	40.7	3
26	30.00	29.38	29.668	40.5	2 P	34.0	7 A	37.3	36.3	36.3	0
27	29.50	29.26	29.405	48.0	11 A	34.0	5 A	41.0	40.0	37.2	1
28	29.59	29.46	29.506	37.0	0 A	26.0	12 P	31.5	31.1	26.8	1
29	29.81	29.59	29.685	37.0	2:30 P	22.0	3:30 A	29 5	30.8	27.0	6
30	29.81	29.68	29.749	44.0	3 P	27.0	5:30 A	35.5	35.9	29.8	10
31	29.74	29.50	29.588	45.5	3 P	25.0	5:30 A	35.3	36.1	32.5	7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	20.3	.156	75.7	S.	212	4.5	30	1 P	11 A			T.
2	28.7	.229	69.7	N.W.	200	4.0	28	10 P	8 A	11 A	T.	
3	14.0	.151	60.0	S.S.W.	293	5.0	32	7 P				
4	25.3	.273	52.0	S.W.	169	2.5	22	7 A	9:30 A	12 P	.35	2.0
5	17.3	.159	63.3	W.	126	3.5	26	11 P	0 A	4 A	.35	2.0
6	−1.3	.071	60.3	S.W.	246	4.0	28	7 A				
7	10.7	.111	70.7	S.	116	2.5	22	1 P				
8	24.0	.208	65.0	S.	200	1.5	17	12 P	11 P	12 P	.02	
9	36.7	.235	91.7	N.E.	153	4.0	28	12 P	0 A	5 A	.05	
10	25.0	.186	73.7	E.	227	2.0	20	10 P	11 P	12 P	.04	
11	34.3	.214	94.3	N.	222	1.5	17	3 P	0 A	8 P	1.70	
12	21.7	.196	59.7	N.N.W.	312	6.5	36	6 A				
13	19.7	.210	51.7	W.N.W.	136	2.0	20	5 A				
14	28.0	.197	79.3	N.E.	124	1.0	14	10 A	0 A	8 A	.15	1.5
15	27.3	.181	84.3	N.E.	54	0.0	—	—	1 A	12 P	.10	1.0
16	26.7	.181	81.3	N.W.	29	0.0	—	—	0 A			T.
17	18.7	.180	59.0	W.	36	0.0	—	—				
18	25.0	.267	52.3	S.S.W.	127	5.0	32	6 P				
19	21.0	.162	71.3	N.	303	5.5	33	11 A				
20	26.3	.180	83.0	N.E.	111	0.5	10	9 A	3 P	12 P	.05	
21	43.7	.328	90.3	N.W.	186	10.5	46	9 A	0 A	3 P	1.77	
22	25.0	.210	67.0	W.S.W.	195	5.0	32	3 P				
23	26.0	.247	63.3	S.	49	1.0	14	3 A				
24	36.3	.238	91.0	E.S.E.	54	0.0	—	—	5 A	12 P	.20	
25	35.3	.310	70.0	E.N.E.	75	1.0	14	4 P	0 A	5 A	T.	
26	33.7	.222	90.0	N.	167	0.5	10	7 P	0 A	12 P	.88	
27	32.7	.249	77.7	N.W.	148	3.0	24	4 P	10 P			T.
28	20.7	.166	68.0	W.N.W.	272	5.5	33	7 P	1 A			T.
29	17.7	.174	59.0	W.N.W.	378	6.5	36	3 P				
30	21.0	.201	58.7	N.W.	330	4.5	30	1 P				
31	24.7	.226	61.7	N.W.	232	5.5	33	12 M				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

Usual March weather was prevalent during the month. Much cloudiness and a large precipitation were the most noticeable characteristics and there were but few really pleasant days. The month closed with the change from winter to spring about completed and the season nearly normal.

Comparisons of some of the weather elements for the month with mean March conditions show the following characteristics of interest. The mean pressure was unusually low though considerably higher than the preceding month; the range was less than normal. The total wind movement was slightly below the average and the number of gales very small for the time of year.

The temperature was normal and the range slightly greater than usual. The mean dew point and relative humidity were both about three points below the normal.

The precipitation was largely in excess of the usual amount though slightly less than for the corresponding period last year. The light precipitation during the preceding two months has not been fully offset by the March excess, the deficiency for the three months being about two inches. The amount of cloudiness was abnormal, the percentage being greater than for any previous month on our records.

The snowfall for the month was light and disappeared quickly. The frost was nearly all out of the ground at the close of the month and the roads were dry in places. Spring repairs however have not yet begun.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 148. APRIL, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.22, 28th, 9 A.
Minimum reduced to freezing,	29.03, 7th, 12 M.
Reduced† maximum reading,	30.52, 28th, 9 A.
Reduced† minimum reading,	29.33, 7th, 12 M
Mean tri-daily reduced,	29.970
Monthly range,	1.19

****Air Temperature.*** In Degrees Fahr.

Highest,	86.5, 29th, 4 P.
Lowest,	28.0, 13th, 4:30 A.
Mean hourly,	46.8
Mean of means of max. and min.,	46.4
Mean sensible (wet bulb),	45.6
Monthly range,	58.5
Highest mean daily,	63.5, 29th
Lowest mean daily,	39.0, 3d
Mean maximum,	55.5
Mean minimum,	37.4
Mean daily range,	18.1
Greatest daily range,	50.0, 29th
Least daily range,	5.0, 3d

Humidity.

Mean dew point,	35.6
Mean force of vapor,	.348
Mean relative humidity,	68.1

Precipitation. In inches.

Total precipitation,	5.95
Number of days on which .01 inch or more rain or melted snow fell,	14
Snow, Total in inches,	T.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	6211m.
Greatest daily movement,	448 m., 11th
Least daily movement,	47 m., 6th
Mean daily movement,	207.0 m.
Mean hourly velocity,	8.6 m.

Maximum pressure per square foot, 13.5 lbs.= 52 m. per hour, 15th, 5:00 P., N.E.

Prevailing Direction, North, Northeast.

Summary.

North, Northeast,	13 per cent.
North Northwest,	13 " "
Northeast,	13 " "
North,	27 " "
Other directions,	34 " "

Weather.

Mean cloudiness observed,	75 per cent.
Total cloudiness recorded by the Sun Thermometer,	299 hrs.=74 per cent.
Number of clear days,	6
Number of fair days,	2
Number of cloudy days,	22

Bright Sunshine.

Number of hours recorded, 103 hrs.=26%

Rain, 3d, 4th, 6th, 7th, 8th, 9th, 10th, 16th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 30th.

Snow, 3d.

Gales, 35 miles or more per hour, 35m., 1st, N.N.W.; 39 m., 10th, N.N.W.; 37 m., 11th, N.N.E.; 52 m., 15th, N.E.; 36 m., 16th, N.; 35 m., 26th, N.N.E.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.02	29.54	29.807	53.5	1:30 P	31.0	1 A	42.3	43.0	37.3	4
2	30.12	30.02	30.058	46.0	3 P	33.0	4 A	39.5	420.	39.7	0
3	30.02	29.42	29.608	41.5	12 P	36.5	12 M	39.0	39.0	37.7	0
4	29.62	29.41	29.525	45.0	2 P	38.0	8 P	41.5	41.8	41.0	0
5	29.76	29.62	29.737	50.0	3 P	37.0	5:30 A	43.5	42.6	40.3	0
6	29.78	29.53	29.680	52.0	1 P	34.0	5 A	43.0	42.9	42.2	1
7	29.53	29.33	29.384	46.5	2:30 P	40.0	5:30 A	43.3	43.4	42.5	0
8	29.64	29.46	29.579	47.0	3 P	38.0	6 A	42.5	42.6	39.7	0
9	29.76	29.64	29.690	47.0	2:30 P	36.0	6 A	41.5	42.5	40.7	0
10	29.96	29.76	29.884	51.0	1 P	38.0	5:30 A	44.5	42.8	38.7	1
11	30.14	29.92	30.018	52.5	3 P	39.0	2 A	45.7	46.3	37.3	1
12	30.23	30.08	30.165	61.5	3 P	30.0	6:30 A	45.7	49.0	40.0	13
13	30.19	30.06	30.111	65.5	4 P	28.0	4:30 A	46.7	49.2	41.2	13
14	30.15	30.04	30.083	64.0	2:30 P	28.5	6 A	46.3	46.8	36.3	7
15	30.07	30.00	30.018	53.0	11 A	39.5	6 A	46.3	46.3	38.8	1
16	30.13	29.96	30.061	50.0	2:30 P	40.0	10 A	45.0	44.5	40.3	0
17	30.23	30.10	30.166	63.0	1:30 P	37.5	6 A	40.3	48.8	41.5	13
18	30.25	30.12	30.174	52.5	3 P	32.0	5:30 A	42.3	41.0	39.8	2
19	30.22	30.13	30.166	54.0	4 P	35.0	5 A	44.5	42.9	41.5	1
20	30.13	29.98	30.066	46.0	2 P	40.0	2 A	43.0	43.5	43.0	0
21	29.98	29 80	29.866	55.0	4 P	45.0	0 A	50.0	49.5	48.8	0
22	30.07	29.87	30.004	61.5	11 A	47.0	6 A	54.3	53.2	51.8	1
23	30.15	30.07	30.126	51.0	11 A	44.0	12 P	47.5	48.0	46.2	0
24	30.11	29.80	29.919	49.0	3 P	43.0	5 A	46.0	46.0	45.5	0
25	29.99	29.76	29.859	54.0	5 P	45.0	0 A	49.5	50.2	49.2	0
26	30.36	29.99	30.183	61.5	2 P	40.0	5 A	50.7	50.7	43.3	10
27	30.46	30.36	30.444	64.0	3 P	33.5	4:30 A	48.7	50.4	43.0	10
28	30.52	30.36	30.440	76.5	4 P	29.0	6 A	52.7	53.8	43.5	14
29	30.40	30.16	30.266	86.5	4 P	36.5	5:30 A	61.5	63.5	50.3	9
30	30.16	29.86	30.010	64.0	12:30 P	49.0	4:30 A	56.5	58.2	52.5	2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	30.0	.276	61.3	N.N.W.	383	6.0	35	2:30 P				
2	34.7	.279	73.3	E.N.E.	131	3.0	24	1 A				
3	34.7	.240	86.0	N.E.	224	5.5	33	6 P	5 A	9 A	.90	T.
4	38.7	.275	86.0	N.	153	1.0	14	8 A	9 A	11 P	.12	
5	37.7	.277	81.7	N.	117	0.0	—	—				
6	29.3	.300	87.3	E.S.E.	47	0.0	—	—	1 P	12 P	1.19	
7	21.0	.284	91.0	N.N.W.	294	1.5	17	8 A	0 A	12 P	1.09	
8	34.3	.281	72.3	N.N.W.	174	0.5	10	8 A	0 A	12 P	.03	
9	37.3	.280	81.3	N.	167	2.0	20	2 P	0 A	12 P	.02	
10	32.7	.276	68.7	N.	416	7.5	39	2 P	3 P	6 P	T.	
11	20.3	.315	38.7	N.	448	7.0	37	1 P				
12	25.7	.367	45.3	N.N.W.	251	4.0	28	10 A				
13	31.7	.395	47.7	S.W.	71	1.0	14	8 P				
14	18.7	.345	36.3	E.	148	2.5	22	7 P				
15	27.0	.333	42.7	N.	344	13.5	52	5 P				
16	31.7	.322	55.3	N.	402	6.5	36	4 P	7 A	2 P	.01	
17	29.3	.383	46.0	N.N.E.	270	3.0	24	9 A				
18	35.3	.283	75.7	E.	126	1.0	14	9 P				
19	37.3	.304	75.3	S.	118	0.5	10	7 A	8 A	11 A	T.	
20	41.7	.291	89.7	N.N.E.	136	1.0	14	10 A	1 P	12 P	.05	
21	46.3	.377	85.3	N.E.	280	5.0	32	7 P	0 A	9 P	1.17	
22	50.7	.410	89.3	E.N.E.	170	0.5	10	7 P	1 A	12 P	.20	
23	44.7	.332	89.3	N.N.E.	135	0.0	—	—	0 A	12 P	.17	
24	43.7	.320	89.0	N.	188	1.5	17	8 P	0 A	12 P	.68	
25	47.0	.378	86.3	N.N.E.	250	3.5	26	9 A	0 A	8 P	.27	
26	34.7	.377	56.0	N.E.	338	6.0	35	1 P				
27	32.0	.403	48.0	N.E.	244	3.0	24	1 P				
28	34.0	.507	46.0	S.W.	55	0.0	—	—				
29	37.0	.665	38.3	S.S.E.	60	0.0	—	—				
30	48.7	.471	72.7	S.E.	71	0.5	10	8 P	12 M	12 P	.05	

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

Rainy and disagreeable weather was generally prevalent during the month. Although the precipitation was more than twice the normal, the total in inches was much less than the large number of cloudy and rainy days led one to expect. During the first third of the month only six hours of bright sunshine was recorded. But four fair or clear days were noted during the first twenty-five days of the month. A few bright days followed but the month closed with stormy weather.

The mean barometer was slightly below the normal and the monthly range a little greater than usual. The total wind movement was over a thousand miles more than the April average, and larger than any previous record for this month at this station. The prevailing direction of the wind was from an unusual quarter and doubtless had an influence on the rainfall.

The mean temperature was nearly normal notwithstanding the excessive cloudiness, wind and rain. The range of 50 degrees for a single day, the 29th, is of interest as an unusual record here.

The precipitation was more than for any previous April on our records, and following the large record of the previous month makes an excess for the year to date, notwithstanding the small amount occurring the first two months.

The amount of bright sunshine was less than one-half the normal and much below any previous record for April.

But little progress was made with the spring work during the month owing to the inclement weather. At the close of the month all seeding and planting was behind and the season was considerably backward.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

LIBRARY
Rhode Island
EXPERIMENT STATION

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 149. MAY, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.90, 25th, 9 P.
Minimum reduced to freezing, 29.13, 3d, 3 A.
Reduced† maximum reading, 30.20, 15th, 9 P.
Reduced† minimum reading, 29.43, 3d, 3 A.
Mean tri-daily reduced, ... 29.877
Monthly range, ...77

****Air Temperature.*** In Degrees Fahr.

Highest, ... 82.0, 24th, 1:30 P.
Lowest, ... 31.5, 6th, 5:30 A.
Mean hourly, ... 56.2
Mean of means of max. and min., ... 55.8
Mean sensible (wet bulb), ... 51.3
Monthly range, ... 50.5
Highest mean daily, ... 69.0, 24th
Lowest mean daily, ... 44.7, 2d
Mean maximum, ... 66.4
Mean minimum, ... 45.1
Mean daily range, ... 21.3
Greatest daily range, ... 43.5, 7th
Least daily range, ... 4.0, 19th

Humidity.

Mean dew point, ... 45.7
Mean force of vapor, ...495
Mean relative humidity, ... 68.1

Precipitation. In inches.

Total precipitation, ... 6.91
Number of days on which .01 inch or more rain or melted snow fell, ... 20

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 4525m.
Greatest daily movement, ... 353 m., 3d
Least daily movement, ... 23 m., 30th
Mean daily movement, ... 146.0 m.
Mean hourly velocity, ... 6.1 m.
Maximum pressure per square foot, 11.5 lbs.= 48 m. per hour, 5th, 2 P., N.N.W.
Prevailing Direction, Southwest.

Summary.

South, ... 26 per cent.
Southwest, ... 16 " "
North, ... 10 " "
Other directions, ... 48 " "

Weather.

Mean cloudiness observed, ... 70 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 294 hrs.=65 per cent.
Number of clear days, ... 5
Number of fair days, ... 9
Number of cloudy days, ... 17

Bright Sunshine.

Number of hours recorded, . . . 159 hrs.=35%

Rain, 1st, 2d, 3d, 9th, 10th, 11th, 12th, 13th, 18th, 19th, 20th, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 30th.

Last Frost, 6th.

Gales, 35 miles or more per hour, 45m., 3d, N.; 41 m., 4th, N.N.W.; 48 m., 5th, N.N.W.

Thunder and Lightning, 2d, 24th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.96	29.84	29.913	69.0	5 P	47.0	12 P	58.0	56.4	51.0	4
2	29.96	29.47	29.681	51.0	11:30 A	40.0	5:30 A	45.5	44.7	40.2	0
3	29.92	29.43	29.727	56.0	4 P	41.0	12 P	48.5	48.9	41.2	8
4	29.96	29.82	29.884	63.5	4:30 P	36.5	5:30 A	50.0	53.1	45.2	8
5	29.88	29.64	29.379	66.0	3 P	39.0	5:30 A	52.5	54.1	46.3	13
6	29.95	29.82	29.872	67.0	5 P	31.5	5:30 A	49.3	51.0	44.7	6
7	29.83	29.72	29.772	80.5	4 P	37.0	5 A	56.7	61.6	52.0	12
8	30.00	29.80	29.893	78.5	2:30 P	45.0	5 A	61.7	63.0	52.8	11
9	30.04	29.96	30.010	73.5	4 P	46.0	6 A	59.7	61.8	55.5	2
10	30.05	29.74	29.968	64.5	1:30 P	53.5	5 A	59.0	57.0	54.5	0
11	29 74	29.62	29.648	67.5	3 P	54.0	5 A	60.7	58.6	57.2	0
12	29.74	29.64	29.684	69.0	3 P	52.0	4 A	60.5	59.4	53.2	5
13	29.91	29.71	29.789	63.5	4 P	45.0	6 A	54.3	53.0	47.7	8
14	30.07	29.91	30.028	66.0	3 P	41.5	5:30 A	53 7	56.4	48.7	8
15	30.15	30.04	30.102	71.0	3 P	46.0	12 P	58.5	58.5	50.8	9
16	30.16	30.02	30.094	76.0	6 P	37.5	5 A	56.7	60.2	52.3	13
17	30.10	29.88	29.972	76.0	3 P	43.0	5:30 A	59.5	62.5	53.0	14
18	29.93	29.83	29.861	52.0	2 P	46.5	12 P	49.3	50.4	48.3	0
19	29.93	29.84	29 901	50.5	2:30 P	46.5	0 A	48.5	49.3	48.2	0
20	30.11	29.91	30.066	51.0	5 P	46.5	5 A	48.7	48.6	46.7	0
21	30.11	29 97	30.039	79.0	4 P	47.0	3 A	63.0	62.3	59.7	8
22	30.05	29.76	29.913	82.0	2:30 P	50.0	5 A	66.0	66.6	61.3	12
23	29.81	29.69	29.748	77.5	4 P	57.0	5 A	67.3	69.0	61.8	4
24	30.06	29.75	29.884	82.0	1:30 P	47.0	12 P	64.5	60.0	58.0	2
25	30.20	30.06	30.173	52.0	5 P	46.0	4 A	49.0	47.9	44.7	0
26	30.20	29.98	30.067	69.0	5 P	42.5	5 A	55.7	56.9	50.8	10
27	29.98	29.57	29.730	57.0	2 P	44.0	4 A	50.5	50.4	51.8	0
28	29.74	29.50	29.614	66.0	4 P	50.5	0 A	58.3	58.0	57.5	0
29	29 87	29.74	29.839	55.5	4 P	47.0	12 P	51.3	52.3	50.2	0
30	29.86	29.81	29.826	57.0	5 P	46.5	5 A	51.7	50.9	50.3	0
31	29.81	29.71	29.764	69.5	3 P	47.0	12 P	58.3	57.9	54.5	2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	45.0	.482	66.3	W.S.W.	89	1.0	14	7 P	0 A	2 A	.04	
2	29.7	.302	64.0	S.	226	2.5	22	8 P	11 A	12 P	.34	
3	30.7	.343	51.3	N.W.	353	10.0	45	6 P	0 A	3 A	.25	
4	33.3	.436	45.3	N.W.	321	8.5	41	3 P				
5	37.0	.446	52.7	N.N.W.	248	11.5	48	1 P				
6	35.3	.409	53.0	W.	65	1.0	14	2 P				
7	42.3	.607	48.7	S.	62	0.5	10	11 P				
8	42.0	.639	44.7	S.	146	3.0	24	5 P				
9	49.7	.590	65.0	S.S.E.	142	2.5	22	5 P	10 P	12 P	.02	
10	51.3	.492	80.7	E.N.E.	107	4.5	30	11 P	0 A	12 P	.55	
11	54.7	.526	83.3	S.	267	2.0	20	0 A	0 A	12 P	.23	
12	47.3	.533	64.0	S.W.	155	2.5	22	2 P	0 A	9 A	.03	
13	42.0	.411	68.7	W.S.W.	168	3.5	26	2 P	0 A	11 A	.39	
14	39.0	.488	50.0	S.W.	140	3.0	24	11 A				
15	44.3	.496	61.3	S.W.	100	1.5	17	3 P				
16	47.7	.594	59.0	W.	31	0.0	—	—				
17	44.0	.614	50.7	S.	146	2.5	22	4 P				
18	47.3	.369	89.0	E.	110	0.5	10	2 P	1 A	12 P	1.02	
19	46.3	.360	88.0	N.	173	1.5	17	4 P	0 A	12 P	.51	
20	44.0	.351	82.0	N.N.E.	232	3.0	24	6 A	0 A	7 A	.02	
21	56.3	.655	74.7	S.W.	41	0.5	10	8 P				
22	56.7	.737	65.7	S.S.E.	151	1.0	14	6 P	11 P	12 P	.08	
23	56.7	.734	64.3	S.W.	197	4.5	30	5 P	0 A	6 A	.18	
24	54.0	.663	74.3	N.N.W.	132	4 0	28	4 P	3 P	10 P	1.55	
25	40.7	.336	76.3	N.N.E.	156	1.0	24	8 A	4 A	4 P	.08	
26	43.3	.495	60.0	S.	85	1.0	14	4 P	8 P	12 P	.06	
27	51.0	.400	94.7	N.	74	0.5	10	10 P	0 A	12 P	1.11	
28	56.0	.518	87.3	N.	122	0.5	10	8 A	0 A	12 P	.06	
29	48.0	.398	84.7	N.N.E.	127	1.5	17	12 M	0 A	12 P	.28	
30	49.0	.390	89.3	S.	23	0.0	—	—	0 A	12 P	.06	
31	50.7	.524	71.7	S.	136	1.0	14	2 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month was generally disappointing and disagreeable. The rainy and lowering skies which characterized April, continued without much interruption throughout May, the last third of the month being especially stormy. Aside from the features incidental to precipitation the departures from normal conditions were small.

A comparison of the records of the month with normal conditions shows the following features: The barometer was generally steady giving a small range; the mean pressure was about one-tenth lower than the May mean. The total wind movement was nearly normal. The prevailing direction by days was more varied than usual, wind from the south, however, was a prominent feature.

The mean dew point was more than three degrees below the normal and the relative humidity slightly higher than usual. The mean temperature was only about a degree lower than usual and the range was quite small.

The total precipitation was nearly an inch more than the unusual record for April and made a new high record for May. The total for the first five months of the year shows an excess of about four inches. The amount of cloudiness was in keeping with the precipitation, the hours of bright sunshine being fewer than for any previous May on our records.

Corn planting has been delayed and much of it is not yet in. Onions and tobacco have suffered from the wet weather. Grass has made good progress and promises well.

Indications are that the apple crop will be light. Peaches, so far, look well. Early small fruits are backward but a good crop is expected.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 150. JUNE, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.95, 13th, 7 A.
Minimum reduced to freezing,	29.35, 23d, 3 P.
Reduced† maximum reading,	30.24, 13th, 7 A.
Reduced† minimum reading,	29.63, 23d, 3 P.
Mean tri-daily reduced,	29.952
Monthly range,	.61

****Air Temperature.*** In Degrees Fahr.

Highest,	98.5, 28th, 3 P.
Lowest,	41.0, 16th, 5 A.
Mean hourly,	68.0
Mean of means of max. and min.,	66.7
Mean sensible (wet bulb),	61.4
Monthly range,	57.5
Highest mean daily,	82.9, 28th
Lowest mean daily,	53.5, 1st
Mean maximum,	80.1
Mean minimum,	54.4
Mean daily range,	25.7
Greatest daily range,	39.5, 12th
Least daily range,	9.5, 15th

Humidity.

Mean dew point,	56.2
Mean force of vapor,	.755
Mean relative humidity,	65.5

Precipitation. In inches.

Total precipitation,	0.87
Number of days on which .01 inch or more rain or melted snow fell,	5

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3647m.
Greatest daily movement,	264 m., 9th
Least daily movement,	36 m., 12th, 26th
Mean daily movement,	121.6 m.
Mean hourly velocity,	5.1 m.
Maximum pressure per square foot,	7.5 lbs.= 39 m. per hour, 8th, 4 P., W.; 9th 3 P., N.N.W.
Prevailing Direction,	South Southwest.

Summary.

South,	42 per cent.
Southwest,	15 " "
West,	13 " "
Other directions,	30 " "

Weather.

Mean cloudiness observed,	48 per cent.
Total cloudiness recorded by the Sun Thermometer,	203 hrs.=44 per cent.
Number of clear days,	11
Number of fair days,	9
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded, . . . 254 hrs.=56%

Rain, 2d, 6th, 7th, 14th, 20th, 21st, 22d, 23d, 29th.

Gales, 35 miles or more per hour, 37m., 7th, S.; 39 m., 8th, W.; 39 m., 9th, N.N.W.

Thunder and Lightning, 4th, 6th, 22d, 23rd, 29th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.86	29.78	29.828	60.0	1 P	43.0	5 A	51.5	53.5	53.2	0
2	29.92	29.82	29.872	69.0	4 P	51.0	5 A	60.0	58.0	54.3	2
3	29.84	29.76	29.789	69.0	12 M	52.0	12 P	60.5	60.1	54.8	6
4	29.96	29.79	29.856	78.0	3 P	46.0	5 A	62.0	64.6	59.0	8
5	30.04	29.96	29.985	83.0	3 P	48.0	5 A	65.5	69.5	61.7	10
6	29.99	29.86	29.926	86.0	3 P	59.5	5 A	72.7	72.7	67.0	10
7	29.91	29.75	29.783	72.0	3 P	57.0	12 P	64.5	63.8	62.8	0
8	29.90	29.76	29.807	64.0	1 P	50.0	10 P	57.0	56.8	50.0	3
9	29.98	29.79	29.879	65.5	4 P	47.0	6 A	56.3	57.5	50.5	4
10	30.12	29.98	30.063	77.0	5 P	47.0	4:30 A	62.0	62.9	56.5	8
11	30.20	30.09	30.152	76.0	4 P	44.0	4:30 A	60.0	63.2	59.7	5
12	30.19	30.05	30.104	88.5	3 P	49.0	4 A	68.7	68.5	62.2	12
13	30.24	30.13	30.184	84.5	4 P	57.5	5 A	71.0	71.5	62.5	14
14	30.13	29.87	29.964	75.0	6 P	56.0	5 A	65 5	66.4	65.5	0
15	30.13	29.92	30.116	61.5	4 P	52.0	12 P	56.7	60.2	52.7	0
16	30.11	29.99	30.054	78.0	5 P	41.0	5 A	59.5	61.2	55.3	14
17	30.07	29.92	30.005	78.0	5 P	41.5	5 A	59.7	62.8	53.7	15
18	30.02	29.92	29.987	79.5	3 P	46.0	5 A	62.7	65.9	55.7	13
19	30.13	29.98	30.028	80.0	4 P	51.0	5:30 A	65.5	66.1	55.7	12
20	30.19	30.08	30.131	78.5	4 P	55.0	5 A	66.7	66.7	59.5	5
21	30.17	30.01	30.065	79.5	5 P	58.0	3 A	68.7	66.4	65.0	2
22	30.01	29.78	29.859	84.0	5 P	64.5	4:30 A	74.3	73.0	70.0	10
23	29.78	29.63	29.704	88.0	1 P	62.0	5 A	75.0	72.2	65.7	9
24	29.93	29.72	29.829	83.0	4 P	59.0	4:30 A	71.0	73.3	66.3	10
25	30.08	29.93	30.027	87.0	5 P	59.0	4:30 A	73.0	74.7	66.2	15
26	30.12	30.07	30.108	94.5	3 P	60.0	4 A	77.3	78.7	69.0	15
27	30.12	29.91	29.974	95.5	3:30 P	68.0	5 A	81.7	80.1	70.7	12
28	29.93	29.80	29.859	98.5	3 P	68.0	4:30 A	83.3	82.9	72.5	14
29	29.84	29.69	29.776	96.0	3 P	70.0	4 A	83.0	81.7	74.5	11
30	29.90	29.77	29.846	95.0	4 P	69.5	4:30 P	82.3	82.6	68.8	15

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	50.7	.454	83.0	N.N.E.	49	0.0	—	—				
2	51.0	.499	76.7	S.	115	1.0	14	6 P	4 A	6 A	.05	
3	49.3	.549	67.0	W.	170	4.0	28	12 M				
4	53.7	.679	64.0	W.	126	4.0	28	1:30 P				
5	55.7	.784	61.7	S.W.	46	0.5	10	6 P				
6	66.3	.865	67.0	S.	193	3.0	24	5 P	3 P	7 P	T.	
7	65.0	.612	91.3	S.S.E.	200	7.0	37	3 P	5 A	10 P	.38	
8	43.0	.465	61.0	W.	175	7.5	39	4 P				
9	41.7	.483	56.0	W.N.W.	264	7.5	39	3 P				
10	50.3	.617	61.7	N.W.	150	3.0	24	10 A				
11	51.0	.606	65.7	S.S.W.	38	0.5	10	5 P				
12	56.0	.806	62.0	N.W.	36	0.0	—	—				
13	58.7	.812	63.7	S.	79	0.5	10	8 P				
14	63.3	.716	82.7	S.	171	0.5	10	6 A	1 P	4 P	T.	
15	47.7	.494	67.3	N.E.	134	1.5	17	9 A				
16	49.7	.578	65.7	S.W.	40	0.0	—	—				
17	44.7	.621	51.7	S.	55	0.0	—	—				
18	46.7	.677	50.3	S.	128	1.0	14	6 P				
19	45.3	.705	46.0	S.S.E.	97	0.5	10	5 P				
20	52.3	.681	60.7	S.	229	3.5	26	8 P	9 P	10 P	T.	
21	62.3	.704	82.3	S.	151	0.5	10	0 A	2 P	4 P	T.	
22	68.0	.845	83.0	S.	99	0.0	—	—	6 A	12 P	.40	
23	62.7	.775	75.0	S.W.	97	0.5	10	2 P	0 A	4 A	.01	
24	61.7	.859	65.7	N.	135	4.5	30	1 P				
25	60.7	.931	59.0	N.	93	2.5	22	1 P				
26	63.0	1.094	58.0	S.E.	36	0.0	—	—				
27	64.7	1.133	57.7	S.S.W.	133	0.5	10	5 P				
28	67.7	1.205	59.7	S.	114	0.0	—	—				
29	71.0	1.155	68.0	S.S.E.	158	2.0	20	4 P	10 A	1 P	.03	
30	61.3	1.154	50.3	W.S.W.	136	2.0	20	1 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

Generally fair and dry weather prevailed throughout the month. Following the abnormal conditions of the previous two months, the contrast was especially noticeable. The high temperature prevailing during the last decade of the month was very oppressive.

The atmospheric pressure was quite steady during the month, giving about the usual mean barometer and a rather small range. The total wind movement was slightly less than the June normal.

The mean temperature was about one and one-half degrees above the normal, and although one of the high records, it is exceeded by the records for 1892 and 1895. The maximum exceeded the highest previous record for the month by three and one-half degrees and was half a degree higher than our previous maximum at this station —that of 98 degrees on July 20, 1894.

The precipitation for the month shows a much greater departure from the normal than any of the other weather elements. The total was less than one-fourth the usual amount and only about one-half the previous low record for June. Notwithstanding the small amount for the month the total for the first half of the year shows an excess of one inch.

The mean dew point and relative humidity were both low while the amount of sunshine was considerably above the normal.

Crops have made good progress during the month and show a decided improvement over their condition at the end of May. Hay will be good in this locality. Other crops need rain, though they have suffered but little as yet from drought.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 151. JULY, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.00, 13th, 9 A.
Minimum reduced to freezing,	29.42, 7th, 4 P.
Reduced† maximum reading,	30.29, 13th, 9 A.
Reduced† minimum reading,	29.70, 7th, 4 P.
Mean tri-daily reduced,	29.929
Monthly range,	.59

****Air Temperature.*** In Degrees Fahr.

Highest,	100.5, 2d, 1-30 P.
Lowest,	48.5 13th, 5 A.
Mean hourly,	72.5
Mean of means of max. and min.,	73.3
Mean sensible (wet bulb),	67.2
Monthly range,	52.0
Highest mean daily,	83.9, 1st
Lowest mean daily,	61.9, 25th
Mean maximum,	84.5
Mean minimum,	62.0
Mean daily range,	22.5
Greatest daily range,	36.0, 13th
Least daily range,	8.0, 6th, 9th, 29th

Humidity.

Mean dew point,	63.4
Mean force of vapor,	.837
Mean relative humidity,	72.3

Precipitation. In inches.

Total precipitation,	3.86
Number of days on which .01 inch or more rain or melted snow fell,	14

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	2763m.
Greatest daily movement,	206 m., 28th
Least daily movement,	25 m., 26th
Mean daily movement,	89.1 m.
Mean hourly velocity,	3.7 m.
Maximum pressure per square foot, 14.5 lbs.= 54 m. per hour, 2d, 4 P., W.	
Prevailing Direction, Southwest.	

Summary.

South,	23 per cent.
West,	19 " "
South Southwest,	10 " "
South Southeast,	10 " "
Other directions,	38 " "

Weather.

Mean cloudiness observed,	63 per cent.
Total cloudiness recorded by the Sun Thermometer,	254 hrs.=55 per cent.
Number of clear days,	7
Number of fair days,	11
Number of cloudy days,	13

Bright Sunshine.

Number of hours recorded, . . . 208 hrs.=45%

Rain, 2d, 4th, 5th, 6th, 9th, 10th, 17th, 21st, 24th, 25th, 26th, 28th, 29th, 30th.

Gales, 35 miles or more per hour, 54m., 2d, W.

Thunder and Lightning, 2d, 4th, 5th, 6th, 10th, 16th, 17th, 18th, 21st.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.02	29.91	29.973	94.0	4:30 P	70.0	4 A	82.0	83.9	74.5	8
2	30.03	29.89	29.957	100.5	1:30 P	68.5	5 A	84.5	79.8	72.8	10
3	29.91	29.75	29.814	94.5	3 P	66.5	3 A	80.5	77.3	67.7	13
4	29.91	29.77	29.840	86.0	4 P	60.0	4 A	73.0	74.1	65.7	8
5	29.84	29.78	29.817	82.5	3 P	64.0	1 A	73.3	70.8	67.7	3
6	29.84	29.76	29.810	72.0	4 P	64.0	3 A	68.0	67.5	67.8	0
7	29.87	29.70	29.782	83 5	3:30 P	64.0	12 P	73.7	72.2	69.7	10
8	30.08	29.87	30.033	82.5	4 P	58.0	5 A	70.3	71.5	67.7	13
9	30.17	30.07	30.155	72.0	1 P	64.0	4 A	68.0	66.0	63.7	0
10	30.16	29.97	30.031	83.0	4 P	61.5	4 A	72.3	71.3	66.8	4
11	30.00	29.92	29.941	79.5	12 M	64.0	5 A	71.7	68.0	68.0	1
12	30.25	30.00	30.177	76.0	5:30 P	56.0	12 P	66.0	67.7	61.5	9
13	30.29	30.18	30.223	84.5	1:30 P	48.5	5 A	66.5	66.2	63.5	7
14	30.21	30.05	30.106	89.0	3 P	58.0	4 A	73.5	72.7	71.0	8
15	30.07	29.89	29.937	92.5	3 P	69.5	5 A	81.0	78.5	73.7	12
16	29.90	29.73	29.810	94.0	3 P	72.0	4 A	83.0	80.5	76.0	10
17	29.79	29.74	29.773	85.0	11 A	72.5	5 A	78.7	74.1	72.5	1
18	29.81	29.71	29.774	89.0	1 P	69.0	3 A	79.0	76.6	73.5	4
19	29.94	29.79	29.869	88.0	3 P	56.5	5 A	72.3	75.3	67.8	12
20	30.02	29.94	29.965	85.0	4 P	56.5	5 A	70.7	71.5	62.2	14
21	29.95	29 76	29.852	93.0	3 P	63.5	4 A	78.3	76.7	68.8	4
22	29.86	29.75	29.809	90.5	3 P	69.0	5 A	79.7	80.6	69.3	12
23	29.94	29.86	29.922	89.0	2 P	63.0	5 A	76.0	75.6	65.7	12
24	29.95	29.79	29.866	85.0	3 P	57.5	4 A	71.3	76.2	67.5	10
25	30.02	29.90	29.997	74.0	4 P	54.0	4 A	64.0	61.9	57.0	3
26	30.12	30.00	30.056	79 0	5 P	56.0	6 A	67.5	66.6	59.3	9
27	30.18	30.12	30.138	82.0	3 P	50.5	4:30 A	66.3	65.7	58.8	7
28	30.12	29.79	29.924	71.0	7 P	59.0	3 A	65.0	65.3	62.8	0
29	29 93	29.76	29.895	71.0	4 P	63.0	6 A	67.0	66.2	62.8	0
30	29.90	29.75	29.781	89.0	5:30 P	60.5	4 A	74.7	72.8	70.0	3
31	29.79	29.73	29.766	83.5	4 P	64.0	12 P	73.7	73.9	66.7	1

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	66.3	1.231	55.3	W.	101	4.0	28	11 A				
2	67.7	1.238	61.7	S.W.	102	14.5	54	4 P	4 P	6 P	.12	
3	61.3	1.036	58.0	W.	98	1.0	14	2 P				
4	60.7	.873	63.3	S.S.W.	58	0.5	10	7 A	9 P	12 P	.18	
5	63.7	.802	78.7	W.	95	0.0	—	—	8 P	12 P	.30	
6	67.0	.732	92.7	S.	57	0.5	10	12 P	0 A	11 P	.19	
7	67.3	.882	79.7	S.	128	2.0	20	6 P				
8	64.3	.854	72.3	N.W.	31	0.5	10	3 P				
9	61.7	.654	85.3	N.	60	0.0	—	—	0 A	4 P	.04	
10	64.0	.803	77.3	S.S.E.	94	1.0	14	7 P	2 P	12 P	.65	
11	66.7	.743	90.0	W.	98	0.5	10	3 P				
12	58.0	.616	71.0	N.E.	139	1.5	17	10 A				
13	59.3	.782	69.3	S.	29	0.0	—	—				
14	68.0	.976	76.0	S.	100	1.0	14	5 P				
15	70.0	1.104	71.0	S.S.W.	146	1.0	14	4 P				
16	74.0	1.107	78.3	S.	150	1.5	17	6 P				
17	72.7	.858	91.0	S.E.	52	0.0	—	—	8 A	10 P	.59	
18	71.0	.981	80.7	E.S.E.	48	0.0	—	—				
19	63.3	.924	66.0	N.N.E.	84	1.5	17	11 A				
20	56.0	.804	59.7	S.W.	43	0.0	—	—				
21	64.7	.960	67.7	S.S.W.	118	3.0	24	11 P	3 A	8 P	.05	
22	63.0	1.100	55.3	W.S.W.	152	1.5	17	3 P				
23	59.7	.917	61.7	N.N.W.	70	1.0	14	9 A				
24	61.7	1.005	60.7	W.S.W.	48	2.0	20	3 P	11 P	12 P	.03	
25	53.7	.556	76.3	W.	77	1.0	14	1 A	0 A	6 A	1.15	
26	55.0	.663	68.7	N.N.W.	25	0.0	—	—	4 A	5 A	.02	
27	52.7	.707	60.3	S.S.E.	56	0.5	10	9 P				
28	61.0	.667	80.0	S.	206	1.5	17	3 P	8 A	12 P	.27	
29	60.3	.639	82.7	N.E.	80	0.5	10	5 A	0 A	12 P	.22	
30	68.0	.887	81.7	S.	142	1.0	14	10 A	0 A	6 A	.05	
31	62.7	.836	69.7	W.	40	0.0	—	—				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The characteristics of the weather for July were the unusually high temperature, small wind movement and large amount of cloudiness.

The period of oppressive heat began on June 22d and continued with but little interruption until July 25th, making a record without parallel at this station. During this time the record for maximum temperature was twice broken, first with 98.5 degrees on June 28th, and afterwards on July 2d, when 100.5 degrees was recorded. The daily maximum fell below 80 degrees on only four days of the thirty-three and the daily mean was below 70 degrees on but five days. On nine days of the period a mimimum below 60 degrees was noted.

The mean barometer for July was unusually low and the range very small. Fluctuations of pressure were generally slow and unimportant. The total wind movement was about four-fifths the normal and but one gale was recorded.

The total precipitation while considerably below the normal was well distributed throughout the month. The percentage of cloudiness was considerably above the mean. The relative humidity and mean dew point were both high.

Hay is all harvested and a fair crop is reported. Tobacco is well advanced and a good yield is expected. The outlook for a potato crop is very poor. Peaches, plums and grapes promise a good yield in this section, but the apple crop will be very light.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 152. AUGUST, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.99, 6th, 12 M.
Minimum reduced to freezing,	29.48, 15th, 10 P.
Reduced† maximum reading,	30.28, 6th, 12 M.
Reduced† minimum reading,	29.76, 1st, 0 A., 15th, 10 P.
Mean tri-daily reduced,	30.024
Monthly range,	.51

****Air Temperature.*** In Degrees Fahr.

Highest,	86.5, 21st, 4 P., 24th, 3 P.
Lowest,	53.0, 17th, 3-30 A.
Mean hourly,	69.9
Mean of means of max. and min.,	70.4
Mean sensible (wet bulb),	65.6
Monthly range,	33.5
Highest mean daily,	75.0, 21st
Lowest mean daily,	64.3, 6th.
Mean maximum,	81.2
Mean minimum,	59.6
Mean daily range,	21.6
Greatest daily range,	29.0, 8th.
Least daily range,	12.0, 22d.

Humidity.

Mean dew point,	62.3
Mean force of vapor,	.771
Mean relative humidity,	76.3

Precipitation. In inches.

Total precipitation,	6.14
Number of days on which .01 inch or more rain or melted snow fell,	14

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	2144m.
Greatest daily movement,	199 m., 10th
Least daily movement,	11 m., 13th
Mean daily movement,	69.2 m.
Mean hourly velocity,	2.9 m.
Maximum pressure per square foot,	2.0 lbs.= 20 m. per hour, 8th, 10th, 15th.
Prevailing Direction,	Southwest.

Summary.

South,	23 per cent.
West,	16 " "
Northeast,	13 " "
South Southeast,	13 " "
North,	10 " "
Southwest,	10 " "
Other directions,	15 " "

Weather.

Mean cloudiness observed,	67 per cent.
Total cloudiness recorded by the Sun Thermometer,	269 hrs.=63 per cent.
Number of clear days,	5
Number of fair days,	8
Number of cloudy days,	18

Bright Sunshine.

Number of hours recorded, 160 hrs.=37%

Rain, 3d, 4th, 6th, 7th, 8th, 9th, 10th, 11th, 13th, 15th, 17th, 18th, 19th, 20th, 22d, 23d 24th, 27th.

Gales, 35 miles or more per hour, none.

Thunder and Lightning, 10th, 15th, 20th, 24th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.91	29.76	29.829	79.0	2:30 P	55.0	5:30 A	67.0	67.9	61.2	12
2	29.97	29.86	29.924	81.0	5 P	60.0	5 A	70.5	67.0	60.3	10
3	29.91	29.79	29.838	79.5	5 P	61.0	3 A	70.3	69.9	68.7	0
4	29.97	29.86	29.914	76.5	6 P	61.0	5 A	68.7	68.2	66.2	0
5	30.19	29.97	30.130	80.5	5 P	58.0	2 A	69.3	69.2	59.8	9
6	30.28	30.16	30.240	71.5	5 P	54.0	5 A	62.7	64.3	61.3	0
7	30.16	29.88	29.944	79.0	4 P	58.5	5 A	68.7	67.1	65.2	2
8	30.03	29.86	29.963	84.0	1:30 P	55.0	5 A	69.5	69.3	64.7	6
9	30.07	29.92	30.053	81.0	4:30 P	54.5	5 A	67.7	69.9	60.8	14
10	30.06	29.81	29.885	85.5	3 P	60.5	4:30 A	73.0	72.1	70.0	3
11	30.02	29.84	29.956	84.0	4 P	62.0	12 P	73.0	73.8	66.0	14
12	30.07	30.01	30.058	74.5	2:30 P	57.0	5 A	65.7	69.7	65.5	0
13	30.11	30.04	30.092	85.0	4 P	63 5	5 A	74.3	72.4	66.3	10
14	30.11	30.01	30.054	79.0	5 P	64.0	4 A	71.5	69 6	66.0	0
15	30.05	29.76	29.912	75.0	5 P	62.0	5 A	68.5	68.9	67.2	0
16	30.01	29.80	29.956	84.0	2:30 P	58.0	12 P	71.0	72.0	65.2	2
17	30.05	29.91	29.975	85.5	5 P	53.0	3:30 A	69.3	70.3	66.0	1
18	30.11	29.94	30.020	81.0	4 P	64.0	5 A	72.5	73.1	69.7	1
19	30.16	30.11	30.141	79.0	12 M	60.0	12 P	69.5	68.3	63.3	2
20	30.14	30.00	30.062	82.0	4 P	60.5	5 A	71.3	69.5	68.7	4
21	30.10	30 03	30.070	86.5	4 P	67.5	3 A	77.0	75.0	71.8	6
22	30.17	30.08	30.154	79.0	3 P	67.0	6 A	73.0	73.0	71.0	0
23	30.19	30.09	30.142	79.5	2:30 P	67.0	6 A	73.3	71.5	70.0	0
24	30.11	29.99	30.020	86.5	3 P	64 0	12 P	75.3	72.6	70.7	4
25	30.04	29.98	30.029	83.5	3:30 P	63.0	5 A	73.3	70.8	65.3	8
26	30.04	29.96	30.025	84.0	5 P	58.0	5:30 A	71.0	69.3	63.3	10
27	30.17	30.03	30.107	82.0	1:30 P	58.5	2 A	70.3	69.1	63.7	4
28	30.22	30.17	30.198	83.5	3 P	56.0	5 A	69.7	69.7	62.8	13
29	30.20	30.06	30.136	83.0	3 P	55.5	6 A	69.3	69.6	61.8	13
30	30.06	29.90	29.957	82.0	3 P	54.0	6 A	68.0	69.5	66.3	10
31	30.01	29.93	29.975	80.0	4 P	56.0	5:30 A	68.0	68.6	63.7	2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	55.7	.723	65.3	N.W.	58	0.5	10	7 P				
2	55.3	.689	68.0	S.E.	20	0.5	10	9 A				
3	67.0	.790	86.0	S.	112	1.0	14	10 A	5 A	7 A	.16	
4	64.3	.713	85.3	N.E.	26	0.0	—	—	10 A	4 P	.03	
5	52.7	.651	57.7	N.	106	1.5	17	9:30 A				
6	58.7	.632	79.3	N.	29	0.0	—	—	10. A	12 P	.40	
7	64.0	.689	88.7	W.S.W.	120	1.0	14	3 P	0 A	5 P	3.07	
8	60.7	.796	68.3	S.W.	81	2.0	20	4 P	2 P	4 P	T.	
9	56.3	.719	65.7	W.	52	0.5	10	4 A	11 P	12 P	T.	
10	67.7	.871	79.7	S.	199	2.0	20	11 A	5:30 P	12 P	.08	
11	61.7	.865	65.7	W.	76	0.0	—	—	0 A	7 A	.05	
12	63.3	.718	82.0	N.E.	16	0.0	—	—				
13	62.7	.828	73.0	W.	11	0.0	—	—	2 A	6 A	.04	
14	63.7	.733	83.0	S.	90	0.0	—	—				
15	66.0	.739	86.7	S.S.E.	63	2.0	20	11 A	9 P	12 P	T.	
16	60.7	.822	68.7	W.	121	1.5	17	1 A				
17	62.7	.821	73.0	S.W.	16	0.0	—	—	9 P	12 P	.20	
18	67.7	.842	81.7	W.	26	0.0	—	—	0 A	6 A	.02	
19	60.3	.691	79.7	S.S.E.	59	1.0	14	5 P	6 P	12 P	.03	
20	67.0	.796	86.0	S.W.	39	0.0	—	—	0 A	12 P	.41	
21	70.3	.917	82.0	N.E.	39	0.0	—	—				
22	70.0	.826	88.3	S.	79	0.5	10	10 A	0 A	12 P	.02	
23	68.3	.860	85.3	S.	121	1.5	17	7 P	0 A	6 P	.07	
24	69.0	.838	88.3	N.W.	149	1.0	14	1 A	4 P	10 P	1.56	
25	61.3	.804	71.3	N.N.W.	115	1.0	14	10 A				
26	60.0	.781	73.7	N.	12	0.0	—	—				
27	60.0	.719	74.3	N.E.	19	0.0	—	—	1:30 A		T.	
28	59.0	.752	72.7	S.	24	0.0	—	—				
29	57.3	.749	68.0	S.S.E.	74	1.0	14	9 P				
30	58.7	.772	67.0	S.	139	0.5	10	3 P				
31	59.3	.745	71.3	S.S.E.	53	0.0	—	—				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

Although the weather during August was, generally speaking, characteristic of the season, a number of unusual features were noted. The mean records for the month of several of the weather elements show considerable departures from the normals, and the ranges were much less than usual, showing that fluctuations were generally slow and unimportant.

A comparison of the records with those of previous years shows the following interesting features; the mean barometer was slightly above the normal and the range quite small. The Draper chart exhibits an unusually steady pressure for the whole month. The total wind movement was only about two-thirds the small August normal, and not a single wind storm approaching a gale was noted.

The mean temperature was nearly two degrees above the normal although there was very little hot weather. The maximum was about 5 degrees lower and the minimum over 10 degrees higher than the usual August maximum and minimum record. The temperature throughout the month was remarkably uniform; the total range being less than several of the daily ranges of the previous two months. Throughout the month the observed temperatures at 7 A. M. and 9 P. M. were all above 60° F. and below 80° F. Both the mean dew-point and relative humidity were considerably above the normal.

The total precipitation was about 50 per cent. more than the August mean. More than half the amount fell during the severe storm of the 6th—7th. The amount of cloudiness noted exceeded any previous August record.

Corn has progressed finely during the month and a good crop is assured. Late potatoes promise a good yield. Much of the tobacco is already cut and an excellent yield is reported. The onion crop is much below the average in this locality.

J. E. OSTRANDER,
Meteorologist.

C. L. RICE,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 153. SEPTEMBER, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.21, 26th, 10 A.
Minimum reduced to freezing, 29.22, 13th, 2 A.
Reduced† maximum reading, 30.51, 26th, 10 A.
Reduced† minimum reading, 29.51, 13th, 2 A., 15th, 10 P.
Mean tri-daily reduced, ... 30.031
Monthly range, ... 1.00

****Air Temperature.*** In Degrees Fahr.

Highest, ... 92.0, 7th, 3 P.
Lowest, ... 33.0, 26th, 6 A.
Mean hourly, ... 62.1
Mean of means of max. and min., ... 62.7
Mean sensible (wet bulb), ... 57.3
Monthly range, ... 59.0
Highest mean daily, ... 73.1, 6th
Lowest mean daily, ... 46.7, 20th.
Mean maximum, ... 74.9
Mean minimum, ... 50.6
Mean daily range, ... 24.3
Greatest daily range, ... 38.0, 9th.
Least daily range, ... 8.0, 18th.

Humidity.

Mean dew point, ... 54.5
Mean force of vapor, ...610
Mean relative humidity, ... 76.8

Precipitation. In inches.

Total precipitation, ... 4.17
Number of days on which .01 inch or more rain or melted snow fell, ... 11

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 2358m.
Greatest daily movement, ... 249 m., 8th
Least daily movement, ... 4 m., 6th, 18th
Mean daily movement, ... 78.6 m.
Mean hourly velocity, ... 3.3 m.
Maximum pressure per square foot, 24.0 lbs.= 69 m. per hour, 11th, 5 P., S.
Prevailing Direction, West Southwest.

Summary.

South, ... 20 per cent.
West, ... 13 " "
Northwest, ... 10 " "
North Northwest, ... 10 " "
North, ... 10 " "
Southwest, ... 10 " "
Other directions, ... 27 " "

Weather.

Mean cloudiness observed, ... 51 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 160 hrs.=43 per cent.
Number of clear days, ... 14
Number of fair days, ... 6
Number of cloudy days, ... 10

Bright Sunshine.

Number of hours recorded, . . . 215 hrs.=57%

Rain, 1st, 2d, 10th, 11th, 12th, 13th, 15th, 17th, 18th, 20th, 29th, 30th.

Gales, 35 miles or more per hour, 69m. 11th, S.

Thunder and Lightning, 15th.

Heavy Frost, 26th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.00	29.94	29.975	67.0	3 P	59.0	12 P	63.0	64.0	62.5	0
2	30.03	29.97	30.009	74.5	3:30 P	58.0	5 A	66.3	63.6	62.2	1
3	30.09	30.03	30.079	74.5	5 P	57.0	6 A	65.7	67.7	62.3	10
4	30.11	30.00	30.058	85.0	4 P	60.0	2 A	72.5	70.1	65.7	12
5	30.13	30.04	30.087	91.0	5 P	59.0	6 A	75.0	72.5	66.0	12
6	30.15	30.06	30.094	91.0	4 P	60.0	6 A	75.5	73.1	66.8	12
7	30.06	29.81	29.922	92.0	3 P	60.0	6 A	76.0	72.0	65.0	13
8	30.03	29.80	29.964	71.0	4 P	52.0	12 P	61.5	62.5	52.0	12
9	30.11	30.00	30.074	78.0	4 P	40.0	6 A	59.0	58.2	51.2	13
10	30.12	29.98	30.060	71.5	3 P	45.0	6 A	58.3	57.8	54.8	1
11	29 98	29.70	29.777	80.5	3 P	57.0	3 A	68.7	64.2	63.0	8
12	29.75	29.54	29.644	68.0	12 M	56.5	6 A	62.3	64.1	63.3	0
13	29.76	29.51	29.615	80.5	3:30 P	58.0	12 P	69.3	67.8	64.2	5
14	29.99	29.76	29.929	80.5	3 P	50.5	6 A	65.5	66.0	60.0	10
15	29.99	29.76	29.845	79.0	6 P	56.0	4 A	67.5	63.9	65.7	0
16	29.91	29.79	29.879	82.5	2:30 P	60.0	12 P	71.3	71.4	63.3	10
17	29 91	29.61	29.784	73.0	2:30 P	53.5	6 A	63.3	60.5	59.8	0
18	29.99	29.89	29.959	61.5	2 P	53.5	12 P	57.5	56.9	54.8	0
19	30.27	29.99	30.137	66.0	4 P	46.0	12 P	56.0	55.9	49.0	11
20	30.27	30.05	30.153	53.0	2 P	39.0	6 A	46.0	46.7	45.8	0
21	30.23	30 04	30.138	68.0	3 P	39.0	6 A	53.5	54.4	48.5	10
22	30.31	30.19	30.239	70.5	3 P	37.5	6 A	54.0	54.7	51.0	9
23	30.21	30.09	30.133	77.5	3 P	45.5	6 A	61.5	61.3	57.7	9
24	30.27	30.00	30.100	84.0	2:30 P	53 0	12 P	68.5	64.7	58.7	8
25	30.45	30.27	30.393	63.0	3 P	40.0	12 P	51.5	51.1	44.7	12
26	30.51	30.38	30.448	64.5	4 P	33 0	6 A	48.7	49.7	45.0	12
27	30.46	30.34	30.392	71.0	4 P	36.0	6 A	53.5	55.0	50.5	12
28	30.37	30.16	30.254	75.0	2 P	43.0	4 A	59.0	59.9	57.7	4
29	30.16	29.79	29.888	76.0	3 P	60.0	5 A	68.0	67.8	50.6	1
30	30.08	29.76	29.891	76.5	3 P	50.0	12 P	63.3	66.4	58.0	8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	61.3	.603	90.3	N.	76	0.0	—	—	4 A	12 P	.50	
2	59.7	.641	82.7	N.W.	53	0.0	—	—	0 A	6 P	.88	
3	59.0	.702	74.7	S.E.	18	0.0	—	—				
4	62.7	.802	75.7	S.E.	18	0.0	—	—				
5	62.7	.839	72.3	E.	8	0.0	—	—				
6	62.7	.873	71.0	N.W.	4	0.0	—	—				
7	60.3	.847	71.0	S.W.	6	0.0	—	—				
8	44.7	.534	59.0	N.	249	3.5	26	9 A				
9	52.3	.493	82.7	N.N.E.	28	0.0	—	—				
10	51.3	.528	76.7	S.S.W.	5	0.0	—	—	2:30 P	5 P	.01	
11	59.0	.687	76.3	N.W.	38	24.0	69	5 P	5 A	7 P	.89	
12	61.7	.639	88.0	S.	79	1.0	14	3 P	9 A	12 P	.07	
13	61.3	.727	79.7	W.	56	0.5	10	2 P	9 A	6 P	.05	
14	56.7	.675	73.7	W.S.W.	12	0.0	—	—				
15	64.7	.695	89.0	S.	130	1.5	17	2 P	6 A	10 P	.32	
16	58.7	.787	65.7	S.W.	132	2.5	22	4 P				
17	58.3	.580	87.3	W.	52	4.0	28	7 P	9:30 A	3 P	.40	
18	53.3	.469	87.0	W.	4	0.0	—	—	10 A		T.	
19	45.0	.436	72.3	N.N.W.	96	1.5	17	3 P				
20	43.7	.335	86.3	N.N.W.	80	0.0	—	—	2 P	8 P	.05	
21	44.0	.425	73.7	N.N.W.	63	0.5	10	2 P				
22	47.7	.477	77.0	S.S.W.	81	1.5	17	2 P				
23	54.0	.607	77.0	S.	155	0.5	10	6 P				
24	54.3	.671	70.0	W.	110	4.0	28	10 P				
25	37.0	.380	64.0	N.	226	3.0	24	8 A				
26	38.7	.395	64.7	W.	68	0.0	—	—				
27	47.0	.473	79.0	S.	106	1.0	14	3 P				
28	55.0	.589	80.7	S.	134	1.0	14	3 P				
29	66.3	.733	90.0	S.	134	2.5	22	4 P	0 A	2 P	.95	
30	53.0	.646	66.0	W.N.W.	137	3.0	24	3 P	0 A	2 A	.05	

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for September was generally pleasant and seasonable, the first and third decades, especially, having many clear days. The equinoctial period was passed with less than the usual amount of stormy weather. Departures from the normal for the various weather elements were generally unimportant.

The mean barometer for the month was slightly below the average and the range was considerably greater than usual. The last third of the month especially was marked by high pressure. The total wind movement was about two-thirds the September normal and but a single gale was noted. On several dates the total daily movement was abnormally light.

The mean temperature was more than a degree above the normal and the range large owing to a high maximum. The mean dew point and relative humidity were both nearly normal.

The total precipitation was about ten per cent. more than the usual amount and most of it fell during a few well-defined storms. More than the average amount of bright sunshine was noted.

Although there was a rather heavy frost on the morning of the 26th no especial damage was reported.

J. E. OSTRANDER,
Meteorologist.

H. L. BODFISH,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 154. OCTOBER, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.35.29th, 9 A.
Minimum reduced to freezing,	29.15, 23d, 6 P.
Reduced† maximum reading,	30.66, 29th, 9 A.
Reduced† minimum reading,	29.44, 23d, 6 P.
Mean tri-daily reduced,	30.084
Monthly range,	1.22

****Air Temperature.*** In Degrees Fahr.

Highest,	75.0, 11th, 3 P., 23d, 3 P.
Lowest,	24.0, 29th, 7:30 A.
Mean hourly,	50.1
Mean of means of max. and min.,	50.7
Mean sensible (wet bulb),	45.7
Monthly range,	51.0
Highest mean daily,	63.2, 11th
Lowest mean daily,	40.7, 29th.
Mean maximum,	63.1
Mean minimum,	38.2
Mean daily range,	24.9
Greatest daily range,	38.0, 8th.
Least daily range,	8.5, 2d.

Humidity.

Mean dew point,	39.9
Mean force of vapor,	.399
Mean relative humidity,	70.5

Precipitation. In inches.

Total precipitation,	3.88
Number of days on which .01 inch or more rain or melted snow fell,	8

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3652m.
Greatest daily movement,	241 m., 23d.
Least daily movement,	14 m., 29th
Mean daily movement,	117.8 m.
Mean hourly velocity,	4.9 m.
Maximum pressure per square foot, 9.0 lbs.= 42 m. per hour, 23d, 8 P., W.N.W.	
Prevailing Direction, West.	

Summary.

South,	10 per cent.
West,	19 " "
Northwest,	13 " "
North Northwest,	13 " "
North,	13 " "
West Southwest,	10 " "
South southeast,	10 " "
Other directions,	12 " "

Weather.

Mean cloudiness observed,	48 per cent.
Total cloudiness recorded by the Sun Thermometer, 163 hrs.=48 per cent.	
Number of clear days,	8
Number of fair days,	14
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, . . . 178 hrs.=52%

Rain, 2d, 3d, 6th, 13th, 14th, 15th, 17th, 18th, 19th, 24th.

Snow, 18th, 24th.

Hail, 24th.

Gales, 35 miles or more per hour, 36m., 6th, E.N.E., 42m., 23d, W.N.W.

Frost, 4th, 5th, 7th, 8th, 16th, 20th, 21st, 26th, 28th, 29th, 30th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.16	29.97	30.079	70.5	3 P	42.0	6:30 A	56.3	56.5	52.3	7
2	29.97	29.57	29.696	62.5	3 P	54.0	12 P	58.3	59.4	57.2	0
3	29.76	29.60	29.665	63.0	3 P	40.0	12 P	51.5	52.5	46.5	4
4	30.09	29.76	29.897	59.5	3 P	32.5	6:30 A	46.0	47.0	42.7	6
5	30.17	30.05	30.103	57.5	3 P	33.0	6 A	45.3	45.1	39.3	6
6	30.34	29.95	30.098	54.0	2:30 P	35.5	5 A	44.7	43.6	39.8	4
7	30.47	30.34	30.410	62.0	3 P	30.0	6:30 A	46.0	45.7	40.0	11
8	30.41	30.25	30.303	68.0	3 P	30.0	6:30 A	49.0	49.5	45.2	10
9	30.27	30.13	30.185	71.0	2:30 P	45.0	6 A	58.0	56.2	53.7	6
10	30.27	30.20	30.229	73.5	3 P	53.5	6 A	63.5	60.8	57.3	5
11	30.28	30.15	30.191	75.0	3 P	57.0	8 A	66.0	63.2	59.0	7
12	30.16	30.03	30.077	74.5	1:30 P	46.0	5 A	60.3	59.1	55.2	7
13	30.05	29.81	29.902	69.5	2:30 P	55.0	6 A	62.3	61.5	61.8	0
14	29.93	29.80	29 871	67.0	0 A	54.0	12 P	60.5	56 5	55.8	0
15	30.13	29.82	30.046	65.0	3 P	40.0	12 P	52.5	52.4	47.0	5
16	30.14	29.95	30.039	65.0	3 P	33.0	8 A	49.0	49.3	45.2	10
17	29.95	29.70	29.748	58.5	1 P	49.0	12 P	49.3	49.5	46.7	2
18	30.09	29.74	29.968	49.5	3 P	37.5	7:30 A	43.5	41.9	37.3	4
19	30.15	29.75	29 921	68.5	1 P	34.0	6 A	51.3	49.1	42.8	3
20	30.41	30.15	30.338	57.0	3 P	29.0	7:30 A	43.0	43.3	36.2	11
21	29.34	30.26	30.295	58.0	3 P	27.0	6 A	42.5	42.0	39.3	6
22	30.26	29.93	30.023	66.0	3 P	35.5	1:30 A	50.7	50.7	47.0	4
23	29 98	29.44	29.593	75.0	3 P	43.0	3 A	59.0	59.6	51.8	6
24	30.03	29.57	29.852	50.0	2:30 P	37.0	12 P	43.5	45.4	37.7	2
25	30.20	30 03	30.127	51.0	3 P	33.0	12 P	42.0	41.1	35.2	8
26	30.23	30.06	30.163	63.5	3 P	27.0	6 A	45.7	45.9	40.7	10
27	30.28	30.02	30.111	61.0	3:30 P	41.5	6:30 A	51.3	50.0	43.8	3
28	30.60	30.28	30.489	59 0	3:30 P	28.5	6 A	43.7	42.7	36.2	10
29	30.66	30.53	30.574	61.0	3:30 P	24.0	7:30 A	42.5	40.7	36.0	10
30	30.54	30.30	30.392	62.0	2:30 P	27.0	6 A	44.5	44.0	41.2	8
31	30.31	30.12	30.211	59.0	3 P	40.0	5 A	49.5	47.8	48.0	3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	48.0	.502	72.0	S.W.	55	0.5	10	9 P				
2	55.0	.527	84.3	S.	219	2.5	22	5 P	4 P	9 P	.50	
3	40.7	.401	70.3	N.N.W.	74	1.0	14	11 A	1 A	5 A	.03	
4	36.3	.344	68.7	N.W.	45	1.0	14	1 P				
5	32.7	.310	67.7	N.	58	0.5	10	2 P				
6	34.0	.297	69.7	N.N.E.	197	6.5	36	3 P	2 A	6:30 A	.05	
7	33.7	.321	67.7	N.	66	1.0	14	10 A				
8	39.0	.416	67.7	W.	74	0.5	10	7 A				
9	50.0	.507	76.3	W.	190	1.5	17	3 P				
10	54.0	.574	77.3	W.	123	1.5	17	1 P				
11	56.0	.602	78.6	W.S.W.	54	0.0	—	—				
12	52.0	.542	79.0	S.S.E.	49	0.0	—	—				
13	54.7	.598	90.3	S.S.E.	211	5.0	32	4 P	9 A	12 P	.50	
14	55.3	.456	96.0	N.N.W.	176	0.5	10	1 P	0 A	12 P	2.68	
15	40.7	.410	69.7	N.W.	101	1.0	14	1 P	0 A	2 A	.05	
16	39.3	.400	70.7	S.W.	73	0.0	—	—				
17	44.0	.354	83.0	W.	119	0.5	10	3 P	9:30 A.	12 M	.02	
18	30.7	.271	66.3	W.N.W.	151	5.5	33	3 P	5 A	1 P	.05	T.
19	33.0	.381	51.7	W.S.W.	236	4.5	30	6 P	2 P	5 P	T.	
20	27.0	.285	60.3	W.	78	0.0	—	—				
21	35.0	.298	77.7	N.W.	46	0.5	10	3 P				
22	41.0	.433	65.0	W.	143	3.0	24	1:30 P				
23	44.0	.574	55.3	W.S.W.	241	9.0	42	8 P				
24	29.7	.285	58.7	N.W.	224	3.0	24	1:30 P	11 A	3 P	T.	T.
25	25.3	.264	56.3	N.N.W.	160	1.5	17	12 M				
26	32.3	.360	60.7	S.S.E.	92	1.0	14	6 P				
27	28.7	.354	69.3	S.W.	174	1.0	14	1 A				
28	24.7	.293	52.0	N.N.W.	79	0.0	—	—				
29	29.0	.286	68.7	W.S.W.	14	0.0	—	—				
30	35.3	.345	71.0	S.	88	0.5	10	3 P				
31	45.3	.380	83.3	S.	42	0.0	—	—				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month was characterized by a large number of pleasant days with more than the usual amount of sunshine. Storms were few and with a single exception of but little account. Frosts were more frequent than usual for the time of year.

A comparison of the records with the usual October conditions shows the following features of more or less interest: The mean barometer was considerably above the normal and the range larger than usual at this time of year. Some of the fluctuations of pressure were large and extended over periods of several days. The total wind movement was about ten per cent less than the normal and but few days showed a large movement. Only on two dates were gales recorded and those were very moderate.

The mean temperature was slightly above the average though the maximum for the month was considerably less than the usual record. The maximum was about normal giving a smaller range than usual. The mean dew point was one and one-half degrees below the normal and the relative humidity quite low.

The total precipitation was slightly less than the normal and about five-sixths of it fell during a single storm on the 13th—15th. The amount of cloudiness was less than usual. A trace of hail was observed on one date and traces of snow on two dates. A number of foggy mornings were noted during the month.

J. E. OSTRANDER,
Meteorologist.

H. L. BODFISH,
Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 155. NOVEMBER, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.05, 10th, 12 P.
Minimum reduced to freezing, 28.92, 14th, 6 A.
Reduced† maximum reading, 30.37, 10th, 12 P.
Reduced† minimum reading, 29.23, 14th, 6 A.
Mean tri-daily reduced, ... 29.932
Monthly range, ... 1.14

****Air Temperature.*** In Degrees Fahr.

Highest, ... 60.0, 1st, 1 P.
Lowest, ... 6.0, 29th, 6 A.
Mean hourly, ... 33.4
Mean of means of max. and min., ... 33.6
Mean sensible (wet bulb), ... 30.8
Monthly range, ... 54.0
Highest mean daily, ... 50.2, 1st
Lowest mean daily, ... 15.2, 28th.
Mean maximum, ... 42.1
Mean minimum, ... 25.1
Mean daily range, ... 17.0
Greatest daily range, ... 32.0, 4th.
Least daily range, ... 7.0, 13th, 17th, 23d.

Humidity.

Mean dew point, ... 24.1
Mean force of vapor, ...211
Mean relative humidity, ... 71.1

Precipitation. In inches.

Total precipitation, ... 3.08
Number of days on which .01 inch or more rain or melted snow fell, ... 7
Snow, total in inches, ... 0.3

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 4583m.
Greatest daily movement, . . . 408 m., 24th.
Least daily movement, ... 12 m., 12th
Mean daily movement, ... 152.8 m.
Mean hourly velocity, ... 6.4 m.
Maximum pressure per square foot, 17.5 lbs.= 59 m. per hour, 24th, 7 P., E.
Prevailing Direction, North.

Summary.

Northwest, ... 20 per cent.
North, ... 17 " "
East Northeast, ... 10 " "
Other directions, ... 53 " "

Weather.

Mean cloudiness observed, ... 65 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 193 hrs.=66 per cent.
Number of clear days, ... 4
Number of fair days, ... 9
Number of cloudy days, ... 17

Bright Sunshine.

Number of hours recorded, . . . 100 hrs.=34%
Rain, 1st, 9th, 11th, 12th, 24th, 25th
Snow, 9th, 11th, 14th, 19th, 24th, 25th, 26th, 29th, 30th.
Hail, 11th, 24th.
Gales, 35 miles or more per hour, 43m., 10th, N.W., 39m., 13th, W.N.W., 40m., 14th, W., 59m., 24th, E., 35m., 26th, N., 35m., 27th, N.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.12	30.01	30.061	60.0	1 P	37.0	12 P	48.5	50.2	48.6	1
2	30.29	30.11	30.222	56.5	2:30 P	29.0	6:30 A.	42.7	41.7	37.5	4
3	30.31	30.14	30.212	59.5	2:30 P	31.0	5:30 A	45.3	42.2	37.8	10
4	30.14	30.00	30.051	57.0	3 P	25.0	7:30 A	41.0	38.5	36.0	6
5	30.10	30.05	30.069	48.0	3 P	27.0	6 A	37.5	38.8	36.5	0
6	30.10	30.03	30.066	49.0	1:30 P	31.0	7:30 A	40.0	39.2	33.8	3
7	30.12	29.97	30.024	51.5	4 P	24.5	7:30 A	38.0	37.4	32.2	5
8	30.09	29.93	29.996	54.0	1 P	28.0	6 A	41.0	40.4	38.5	4
9	30.09	29.95	30.046	50.0	1:30 P	28.0	6 A	39.0	40.6	37.5	2
10	30.37	30.01	30.266	43.0	0 A	22.0	9:30 P	32.5	31.3	33.7	10
11	30.37	29.88	30.136	36.0	3 P	17.0	6 A	26.5	29.7	27.0	1
12	29.88	29.34	29.486	42.5	11 P	31.5	6 A	37.0	34.4	34.8	0
13	29.41	29.31	29.384	37.0	2 P	30.0	12 P	33.5	34.6	29.7	2
14	29.36	29.23	29.280	37.0	1:30 P	29.0	4 A	33.0	31.4	30.0	1
15	29.61	29.36	29.531	40.0	3:30 P	28.5	8 A	34.3	32.8	29.7	4
16	29.85	29.61	29.759	41.0	4 P	28.0	6 A	34.5	34.7	32.3	1
17	29.90	29.82	29.853	40.0	3 P	33.0	5 A	36.5	36.5	32.7	1
18	30.00	29.90	29.974	41.5	3 P	30.0	8 A	35.7	35.3	31.8	0
19	30.08	29.92	29.979	37.0	3 P	29.0	12 P	33.0	32.5	29.7	0
20	30.22	30.08	30.192	39.5	4 P	24.0	12 P	31.7	29.9	26.5	6
21	30.26	30.20	30.234	46.0	2:30 P	17.0	6:30 A	31.5	29.7	26.8	9
22	30.27	30.12	30.181	45.0	3 P	19.0	6:30 A	32.0	31.0	29.2	6
23	30.29	30.12	30.231	32.0	5 P	25.0	5 A	28.5	30.5	29.8	0
24	30.15	29.42	29.666	40.0	1 P	27.5	6 A	33.7	36.0	35.5	6
25	29.46	29 34	29.382	41.0	12 M	33.0	0 A	37.0	37.8	35.5	2
26	29.79	29.46	29.653	35.0	0 A	22.0	12 P	28.5	27.8	23.2	2
27	30.09	29.79	29.966	26.0	3 P	16.0	6:30 A	21.0	20.1	16.0	9
28	30.16	30.09	30.143	21.0	1 P	10.0	6 A	15.5	15.2	13.2	4
29	30.12	29.83	29.922	27.0	1 P	6.0	6 A	16.5	18.1	18.3	2
30	30.07	29.82	29.988	31.0	3 P	15.0	6 A	23.0	22.7	20.8	5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	44.7	.366	84.7	S.	111	0.0	—	—	11:30A	3 P	.40	
2	31.7	.284	73.7	N.	112	2.0	20	4 P				
3	30.3	.297	65.7	N.W.	108	0.5	10	5 A				
4	31.3	.273	74.3	N.W.	24	0.0	—	—				
5	31.7	.250	76.3	N.	108	2.0	20	12 M				
6	26.3	.305	64.0	N.	192	3.5	26	12 M				
7	26.7	.330	72.7	N.	107	1.0	14	12 M				
8	34.0	.279	74.7	N.W.	69	1.5	17	2 P				
9	31.0	.269	69.3	S.	67	1.0	14	11 P	2 P	11 P	T.	
10	4.3	.159	38.0	N.W.	358	9.0	43	1 P				
11	18.0	.174	65.3	S.S.E.	62	0.5	10	4 P	3:30 P	9:30 P	.02	T.
12	31.7	.220	82.7	E.N.E.	12	0.5	10	10 P	2 A	10 P	.85	
13	22.3	.193	62.0	W.N.W.	313	7.5	39	10 A				
14	25.0	.185	74.3	W.	266	8.0	40	1 P	8:30 A	11 P	T.	.1
15	23.3	.188	69.7	S.W.	134	1.5	17	12 P				
16	26.7	.208	71.7	S.S.W.	194	1.0	14	2 P				
17	25.3	.220	62.0	W.N.W.	113	2.5	22	12 M				
18	26.7	.204	73.7	N.W.	58	0.5	10	12 M				
19	24.3	.184	74.3	N.N.W.	178	3.0	24	3 P	3 A	6 P	.01	T.
20	17.7	.173	61.7	N.N.W.	135	1.0	14	4 A				
21	20.3	.184	71.3	N.W.	16	0.0	—					
22	23.7	.193	73.0	S.E.	35	0.5	10	1 P				
23	28.0	.168	95.0	E.N.E.	103	1.0	14	10 P				
24	33.7	.217	90.0	E.	408	17.5	59	7 P	6 A	12 P	1.28	T.
25	32.0	.226	81.3	E.N.E.	304	3.0	24	8 P	0 A	12 M	.50	T.
26	13.7	.145	60.7	N.N.E.	323	6.0	35	2 P	6 A	10 A		T.
27	4.0	.108	53.3	N.N.E.	353	6.0	35	5:30 A				
28	4.3	.092	61.3	N.E.	224	4.0	28	5 A				
29	15.0	.115	83.3	N.	29	0.0	—	—	1 P	12 P	.02	.2
30	14.7	.128	71.7	N.E.	67	2.0	20	1 P	8 A	10 A		T.

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for November was marked by an unusually low mean temperature, low mean barometer and a large amount of cloudiness. The total precipitation while much less than the average was hardly abnormally light. Traces of snow were unusually frequent for the time of year although the measurable amount was very small.

A comparison of the records with the mean November conditions shows the following departures from the normal.

The mean barometer was lower than any previous record for the month at this station. Both the maximum and minimum were unusually low and the range was less than usual. Two well marked periods of low pressure were noted, the first making its minimum record on the 14th and the second on the 25th. The total wind movement was only about five per cent more than the normal, notwithstanding the large daily records from the 24th to the 29th accompanying the low pressure at that time.

The mean temperature was over three degrees below the normal, giving the lowest November mean on our records here. The maximum and minimum records were both several degrees lower than usual although the range was nearly normal. The maximums for the last four days of the month were all well below the freezing point. The mean dew point was over eight degrees below the normal and the relative humidity about four per cent lower than usual.

The total precipitation was about an inch less than usual. Over half the total fell during the storm of the 24th-25th.

The month closed with the ground frozen, several inches of ice formed and the general appearance of winter having begun.

J. E. OSTRANDER, Meteorologist.

H. L. BODFISH, Observer.

U. S. A.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 156. DECEMBER, 1901.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.24, 7th, 7 A.	
Minimum reduced to freezing, 29.11, 29th, 2 P.	
Reduced† maximum reading, 30.58, 7th, 7 A.	
Reduced† minimum reading, 29.42, 29th, 2 P.	
Mean tri-daily reduced,	30.029
Monthly range,	1.13

****Air Temperature.*** In Degrees Fahr.

Highest,	60.0, 14th, 2 P., 15th, 7 A.
Lowest,	−10.5, 7th, 7:30 A.
Mean hourly,	26.4
Mean of means of max. and min.,	26.7
Mean sensible (wet bulb),	24.9
Monthly range,	70.5
Highest mean daily,	53.0, 14th
Lowest mean daily,	6.2, 7th.
Mean maximum,	36.3
Mean minimum,	17.1
Mean daily range,	19.2
Greatest daily range,	42.0, 15th.
Least daily range,	6.5, 17th.

Humidity.

Mean dew point,	17.9
Mean force of vapor,	.171
Mean relative humidity,	69.8

Precipitation. In inches.

Total precipitation,	7.77
Number of days on which .01 inch or more rain or melted snow fell,	16
Snow, total in inches,	25.5
Snow on ground at end of month,	2.0

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4280m.
Greatest daily movement,	520 m., 15th.
Least daily movement,	3 m., 19th.
Mean daily movement,	138.1 m.
Mean hourly velocity,	5.8 m.

Maximum pressure per square foot, 14.5 lbs.= 54 m. per hour, 15th, 3 A., S.W.

Prevailing Direction, Northeast.

Summary.

Northeast,	19 per cent.
Southwest,	10 " "
East Northeast,	19 " "
Other directions,	52 " "

Weather.

Mean cloudiness observed,	65 per cent.
Total cloudiness recorded by the Sun Thermometer,	176 hrs.=62 per cent.
Number of clear days,	4
Number of fair days,	9
Number of cloudy days,	18

Bright Sunshine.

Number of hours recorded, 107 hrs.=38%

Rain, 9th, 10th, 13th, 15th, 24th, 25th, 28th, 29th, 30th.

Snow, 3d, 4th, 15th, 17th, 19th, 20th, 23d, 24th, 25th, 26th, 27th.

Gales, 35 miles or more per hour, 45m., 10th, N.W.; 50m., 14th, S.W.; 54m., 15th, S.W.; 35m., 16th, N.E.;36m., 22d, W.S.W.; 51m., 31st, N.W.

No. days sleighing, 11

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.07	29.91	29 977	48.5	3 P	18.0	7:30 A	33.3	32.5	31.4	8
2	29.93	29.73	29 839	56 0	3 P	34.5	0 A	45.3	43.5	40.3	3
3	30.01	29.67	29.857	40.0	0 A	19.0	12 P	29.5	28.2	24.8	0
4	30.10	29.64	29.900	23.0	2 P	8 0	7:30 A	15.5	15.7	14.1	7
5	30.33	30.10	30.219	26.0	3 P	–6.0	7:30 A	10.0	9.9	8.0	9
6	30.52	30.33	30.454	25.5	2:30 P	–6.0	7 A	9.7	6.3	3.7	9
7	30 58	30.42	30.484	21.5	2:30 P	–10.5	7:30 A	5.5	6.2	6.5	5
8	30 42	30.20	30.321	33.0	1:30 P	14.0	0 A	23.5	23.5	23 4	3
9	30.20	29.87	29 945	47.0	2:30 P	27.0	0 A	37.0	37.9	37.2	5
10	30.06	29.49	29.717	52.0	7:30 A	33.5	3 A	43.2	40.2	38.8	2
11	30.32	30.06	30.259	42.0	1 P	30.0	8 A	36.0	35.0	30.7	4
12	30.42	30.31	30.381	42.5	3 P	21.5	8 A	32.0	29.6	27.7	7
13	30.41	30 29	30.317	41.0	3 P	25.0	0 A	33.0	34.9	34.7	0
14	30.29	29.75	30.019	60.0	2 P	33.5	0 A	46.7	53 0	54.2	0
15	29.92	29 51	29 682	60.0	7 A	18.0	12 P	39.0	39.5	35.0	0
16	30.09	29 92	30.043	20.5	3 P	11.0	8 A	15.7	14.8	10.7	9
17	30.10	29.94	30 037	15.0	4 P	8.5	6 A	11.7	11.3	10.3	0
18	30.14	29.93	30.041	26 0	2 P	10.0	8 A	18.0	15.4	13.3	7
19	30.26	30.14	30.205	23.0	2 P	5.5	6:30 A	14.3	14.2	14.5	1
20	30.34	30.26	30.286	23 0	3 P	7.0	8 A	15 0	14.9	13.5	1
21	30.34	30.20	30.274	26.0	3 P	8.0	12 P	17.0	16.3	9.6	3
22	30.31	29 93	30.137	28.0	12 P	1.0	7 A	14.5	15.0	14.0	6
23	29.93	29 76	29.823	36.0	3 P	24.0	7:30 A	30.0	30.5	28.3	2
24	29 83	29 56	29.663	38.5	3:30 P	29.5	0 A	34.0	34.4	33.0	4
25	30.09	29 71	29.846	36.0	3 P	28.0	12 P	32.0	32.5	31.2	0
26	30.27	30 00	30.166	40.0	2 P	19.5	8 A	29.7	30.3	28.1	5
27	30.23	29.76	29.949	38.0	2 P	27.0	12 P	32.5	32.7	31.2	2
28	30.38	30.09	30.263	37.0	10 P	10.5	8 A	23.7	26.8	26.0	3
29	30.09	29 42	29.529	42.0	8 A	32.0	6 A	37.0	36.1	37.3	0
30	29 69	29.49	29.567	38.0	4 P	30.0	12 P	34.0	36.0	34.3	0
31	29.90	29.59	29.705	39.0	5 P	18.0	12 P	28.5	30.7	26.3	2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	26.3	.220	74.3	W.S.W.	188	0.5	10	3 P				
2	35.0	.302	74.0	W.N.W.	212	1.0	14	8 P				
3	20.7	.146	79.7	E.N.E.	220	5.5	33	8 P	3 A	12 P	**	**
4	4.7	.097	62.3	N.E.	310	5.5	33	12 M	0 A	4 A	.92	15.0
5	−5.0	.083	51.0	N.E.	42	3.5	26	10 P				
6	−12.0	.070	49.3	N.E.	88	0.0	—	—				
7	−3.3	.075	60.3	S.E.	6	0.0	—	—				
8	14.7	.148	66.3	E.	5	0.0	—	—				
9	32.3	.255	74.0	W.S.W.	116	1.0	14	7 A	7 A	12 P	.02	
10	30.3	.290	62.0	N.W.	233	10.0	45	1:30 P	0 A	12 M	.68	
11	24.7	.198	71.7	N.N.W.	116	1.0	14	2 A				
12	23.0	.176	76.3	N.E.	7	0.0	—	—				
13	31.3	.220	79.7	S.W.	11	0.0	—	—	9:30 A	10 P	.02	
14	52.7	.451	90.7	S.W.	326	12.5	50	4 P	1:30 P	12 P	.35	
15	27.7	.271	69.3	E.	520	14.5	54	3 A	0 A	5 P	1.68	T.
16	−11.3	.089	32.3	N.E.	380	6.0	35	10 A				
17	2.7	.077	68.3	E.N.E.	146	2.0	20	3 P	10 A	12 P	.02	0.5
18	3.0	.097	61.0	E.N.E.	61	0.5	10	3 A				
19	7.3	.090	69.3	N.N.E.	3	0.0	—	—	5:30 P	7 P		T.
20	7.7	.092	72.7	N.E.	50	0.0	—	—	11:30A			T.
21	1.3	.093	54.0	E.N.E.	212	4.5	30	12 M				
22	5.0	.104	61.3	S.W.	123	6.5	36	4 P				
23	23.0	.173	74.7	W.	170	5.0	32	1 A	5:30 P	8 P	.05	0.5
24	28.0	.146	75.3	N.N.W.	81	3.0	24	7 P	1 A	9 A	.63	1.5
25	28.3	.183	88.3	N.	68	0.0	—	—	6 A	8 A	.03	0.5
26	22.7	.180	75.0	E.N.E.	34	1.0	14	1 A	8 P	12 P	.08	2.0
27	27.3	.190	81.7	N.N.E.	132	4.0	28	1 P	0 A	11 A	.67	5.5
28	21.0	.165	74.0	S.	50	0.0	—	—	10:30 P	12 P	.02	
29	36.7	.229	94.7	E.S.E.	48	0.5	10	9 A	0 A	12 P	1.90	
30	32.0	.211	84.7	E.N.E.	109	1.0	14	12 M	0 A	1 P	.70	
31	16.3	.172	56.7	N.W.	213	13.0	51	6 P				

*Rain or melted snow at base of tower. **Included in following day.

Corrections for Bulletin No. 155: Total precipitation should read 2.08 in. Total on Nov. 24th, 1901, should read .28 in.

Annual Summary for 1901.

Pressure. In inches.

Maximum reduced to freezing, ... 30.36, Jan. 3d, 10 A., Jan. 20th, 9 A.
Minimum reduced to freezing, ... 28.69, Jan. 28th, 1 A.
Maximum reduced to freezing and sea-level, ... 30.69, Jan. 3d, 10 A., Jan. 20th, 9 A.
Minimum reduced to freezing and sea-level, ... 29.01, Jan. 28th, 1 A.
Mean reduced to freezing and sea-level, ... 29.955
Annual range, ... 1.68

****Air Temperature.*** In degrees Fahr.

Highest, ... 100.5, July 2d, 1:30 P.
Lowest, ... —10.5, Dec. 7th, 7:30 A.
Mean, ... 46.9
Mean of means of max. and min., ... 46.8
Mean sensible (wet bulb), ... 43.4
Annual range, ... 111.0
Highest mean daily, ... 83.9, July 1st.
Lowest mean daily, ... 2.5, Jan. 19th.
Mean maximum, ... 57.1
Mean minimum, ... 36.6
Mean daily range, ... 20.5
Greatest daily range, ... 50.0, Apr. 29th.
Least daily range, ... 3.5 Mar. 12th.

Humidity.

Mean dew point, ... 37.6
Mean force of vapor, ...421
Mean relative humidity, ... 71.0

Wind.

Prevailing direction, ... West.

Summary.

Northwest, ... 11 per cent.
North, ... 10 " "
South, ... 15 " "
West, ... 12 " "
Other directions, ... 52 " "
Total movement, ... 50353 m.
Greatest daily movement, . . . 520 m., Dec. 15th.
Least daily movement, ... 3 m., Dec. 19th.
Mean daily movement, ... 138.0 m.
Mean hourly velocity, ... 5.75 m.

Maximum pressure per square foot, 24.0 lbs.=69 m. per hour, Sept. 11th, 5:00 P., S.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 49.72
Number of days on which .01 or more rain or melted snow fell, ... 135
Snow total in inches, ... 52.3

Weather.

Mean cloudiness observed, ... 60 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2590=58 per cent.
Number of clear days, ... 81
Number of fair days, ... 105
Number of cloudy days, ... 179

Bright Sunshine.

Number of hours recorded, . . 1866=42 per cent.

Dates of Frosts.

Last, ... May 6th.
First, ... Sept. 26th.

Dates of Snow.

Last, ... Apr. 3d.
First, ... Nov. 11th.
Total days of sleighing, ... 46

Gales of 50 or More Miles Per Hour.

Apr. 52 m., 15th, N.E.
July. 54 m., 2d, W.
Sept. 69 m., 11th, S.
Nov. 59 m., 24th, E.
Dec. 50 m., 14th, S.W.; 54 m., 15th, S.W.; 51 m., 31st, N.W.

*Temperature in ground shelter.

H. L. BODFISH,
Observer.

J. E. OSTRANDER,
Meteorologist.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 157. JANUARY, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.34, 29th. 2 A.
Minimum reduced to freezing,	28.85, 12th. 7 A.
Reduced† maximum reading,	30.66, 29th, 2 A.
Reduced† minimum reading,	29.17, 12th, 7 A.
Mean tri-daily reduced,	30.042
Monthly range,	1.49

****Air Temperature.*** In Degrees Fahr.

Highest,	47.0, 22d, 8 A.
Lowest,	-0.5, 20th, 8 A.
Mean hourly,	22.9
Mean of means of max. and min.,	22.2
Mean sensible (wet bulb),	20.4
Monthly range,	47.5
Highest mean daily,	41.9, 22d
Lowest mean daily,	8.0, 4th
Mean maximum,	31.4
Mean minimum,	13.0
Mean daily range,	18.4
Greatest daily range,	34.0. 18th.
Least daily range,	7.5. 8th.

Humidity.

Mean dew point,	12.3
Mean force of vapor,	.134
Mean relative humidity,	66.2

Precipitation. In inches:

Total precipitation,	1.72
Number of days on which .01 inch or more rain or melted snow fell,	11
Snow, total in inches,	11
Snow on ground at end of month,	1 inch.

Wind.

Total movement,	4078m.
Greatest daily movement,	369 m., 28th.
Least daily movement,	15m., 10th.
Mean daily movement,	131.5 m.
Mean hourly velocity,	5.5 m.
Maximum pressure per square foot, 12.0 lbs.= 49 m. per hour, 28th, 7 A.. N.N.E.	
Prevailing Direction, North.	

Summary.

Northeast,	13 per cent.
North Northeast,	19 " "
West.	16 " "
Northwest,	10 " "
North Northwest,	13 " "
East Northeast,	16 " "
Other directions,	13 " "

Weather.

Mean cloudiness observed,	60 per cent.
Total cloudiness recorded by the Sun Thermometer,	174 hrs.=59 per cent.
Number of clear days,	8
Number of fair days,	6
Number of cloudy days,	17

Bright Sunshine.

Number of hours recorded,	120 hrs.=41%

Rain, 21st, 22d, 26th, 27th.

Snow, 3d. 7th. 8th, 10th, 11th, 12th, 21st, 29th. 30th, 31st.

Gales. 35 miles or more per hour, 45m., 1st. N.W.: 36m., 2d, W.; 41m., 3d, N.N.E.; 35m., 22d. S.S.E.: 36m., 27th, N.N.E.; 49m., 28th, N.N.E.

No. days sleighing,	11

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.51	29.89	30 423	18.0	0 A	2.0	9 A	10.0	8 4	5.8	9
2	30.54	29.83	30.207	34 0	12 P	7.0	6 A	20.5	21.5	21.0	1
3	30.11	29.77	29.923	34 0	1 A	9 0	12 P	21.5	25 8	15.7	5
4	30.41	30.11	30.330	14.0	3 P	3 0	8 A	8.5	8.0	6.4	9
5	30.41	30.24	30.295	31.0	2:30 P	3.5	3 A	17.3	19.3	19.5	2
6	30.29	30 21	30.220	38.5	3 P	18 0	6 A	28.3	27.7	25.3	6
7	30.21	30 07	30.115	34.5	3 P	19.0	6 A	26.7	26.1	25.5	2
8	30.11	30.04	30.063	30.0	3 P	22.5	6 A	26.3	26 0	24 8	0
9	30.12	30.00	30.054	35 0	3 P	13 5	8 A	24 3	23 9	21.7	8
10	30.00	29.70	29.771	28.5	5 P	20.0	5 A	24.3	25.9	25.3	0
11	29.70	29.26	29 472	36.5	2 P	23.0	12 P	29.7	31.6	29.5	1
12	29 40	29 17	29 255	24 5	3 P	15.0	12 P	19.7	20 7	18.0	1
13	29.81	29 40	29.632	21.0	3 P	9 0	12 P	15 0	15.3	13 0	2
14	30.08	29 81	30.033	29 0	2:30 A	4 5	7:30 A	16 7	16 6	14 3	8
15	30.07	29 84	29 918	30.5	4 P	12 0	8:30 A	21.3	23 6	20.8	0
16	29.86	29 74	29 794	37 5	2:30 P	12.0	6 A	24 7	26.5	24 0	4
17	30.02	29.82	29 944	28.0	3 P	11.0	8 A	19.5	17.8	13.4	9
18	30.05	29.82	29 920	37.0	3 P	3 0	7:30 A	20.0	22.2	21 7	3
19	30.31	29.82	30.109	36 0	6 A	11.0	12 P	23.5	27.2	22 3	8
20	30.46	30.31	30 403	29 0	3 P	−0.5	8 A	14 3	12.3	9.4	7
21	30.37	29 77	30 092	39.0	12 P	7.0	0 A	23.0	23.9	25.2	0
22	29.77	29.31	29 359	47.0	8 A	36 0	12 P	41.5	41 9	40.7	0
23	29.74	29.38	29.583	36.0	0 A	28.0	12 P	32.0	33.3	29.0	2
24	30.12	29.74	29.942	37.0	2:30 P	24.0	12 P	30 5	31.3	27.8	6
25	30.50	30.12	30.373	35.0	4 P	15 0	7:30 A	25.0	25.5	21.5	9
26	30.54	30.17	30.384	38.0	11 P	16.0	3 A	27 0	27.4	28.3	0
27	30.22	29.86	30.002	46 0	12 M	21 0	12 P	33 5	36.3	32.7	1
28	30.65	30.22	30.556	21.0	0 A	9.5	8 A	15.3	15.3	10.3	10
29	30.66	30.33	30.500	18.5	3 P	8.5	7:30 A	13 5	14.0	10.8	2
30	30.39	30.21	30.258	25 5	5 P	11.5	9 A	18.5	16.9	14.0	5
31	30.43	30.26	30.351	24 0	6 P	9.5	8 A	16.7	17.2	16.1	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	-9 7	.068	42.7	N.N.E.	354	10.0	45	0:30 A				
2	16.3	.133	75.3	W.	146	6.0	36	5 P				
3	5 0	.106	57.0	N.N.E.	260	8.5	41	11 A	0 A	4 A	.03	1.5
4	-2.3	.067	62.0	N.E.	202	2.0	20	1:30 A				
5	14 0	.128	72.0	N.W.	91	0.5	10	3 P				
6	18 7	.162	69.0	W.	35	0.0	—	—				
7	21.3	.153	77.0	E.N.E.	112	0.5	10	4 P	6 P	11 P	.02	.5
8	20.7	.146	79.0	E.N.E.	122	0.0	—	—	1 P	11 P		T.
9	15.7	.137	74.0	S.E.	23	0.0	—	—				
10	22.7	.144	86.3	N.N.W.	15	0.0	—	—	8 A	2 P	.01	T.
11	25.0	.181	78.0	W.	72	0.0	—	—	3 P	12 P	.25	4.5
12	10.3	.113	65.0	N.N.W.	179	2.5	22	8 A	0 A	9 A	.10	2.5
13	6.0	.090	67.7	N.N.E.	164	2.0	20	3 A				
14	1.0	.108	52.3	N.N.W.	45	0.0	—	—				
15	16 7	.126	79 0	N.W.	61	0.0	—	—				
16	16 3	.158	64.7	W.	39	0 5	10	8 P				
17	-3 0	.101	43 3	E.N.E.	203	0.0	—	—				
18	16.3	.151	71.7	W.	119	1.5	17	4 P				
19	12 7	.124	57.0	N.N.E.	176	3 0	24	8 A				
20	-10.3	.091	48.0	N.N.E.	21	0.0	—	—				
21	21 3	.155	80 0	E.N.E.	32	0 0	—	—	10 A	12 P	.03	T.
22	39.3	.267	90.7	S.S.W.	255	6.0	35	8 A	0 A	3 P	.57	
23	23 0	.182	69.0	N.	191	5.5	33	7 A				
24	19.7	.178	64 7	N.N.W.	159	2.0	20	12 M				
25	14.0	.135	65.3	N.E.	59	0.0	—	—				
26	24.7	.171	82.3	S.E.	92	1.0	14	3 P	11:30 A	12 P	.17	0 5
27	26.0	.219	70.0	N.W.	187	6 0	35	5 P	0 A	9 A	.47	
28	-6.0	.084	41.7	N.N.E.	36)	12.0	49	7 A				
29	-5.7	.086	42.3	N.E.	91	0 5	10	9 A				
30	1.7	.099	52.3	E.N.E.	135	0 5	10	3 P	4 A	10 A	.02	0.5
31	10.0	.101	72.3	N.E.	69	0 0	—	—	5 P	12 P	.05	1.0

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

Good wintry weather prevailed throughout the month although a light snow fall gave less than the usual amount of sleighing. The monthly means were all below the January normals and in some instances the departures were unusually large. No extremes of temperature were noted and not a single heavy storm occurred.

While the mean barometer and monthly range were both but slightly less than the normals, the fluctuations were more marked than usual. The depressions of the 3d, 12th, 22d and 27th were each accompanied by a small storm, although they were the principal storms of the month.

The total wind movement was about 10 per cent less than usual. The daily records of the 1st and 28th were large for this station.

The mean temperature was nearly a degree below the normal and the range more than 10 degrees less than the usual amount. The mean dew point and relative humidity were both new low records for January, the former being nearly 7 degrees lower than the normal and the latter about ten points less than the normal.

The total precipitation was less than one half the usual amount and less than any of our previous records for the month excepting that of 1896. The greater part occurred as rain, the only snow of any amount falling on the 11th–12th. A high percentage of cloudiness was noted during the month.

J. E. OSTRANDER, Meteorologist.

H. L. BODFISH, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 158. FEBRUARY, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.95, 1st, 11 A.
Minimum reduced to freezing,	28.54, 17th, 11 P.
Reduced† maximum reading,	30.27, 1st, 11 A.
Reduced† minimum reading,	28.86, 2d, 6 P., 17th, 11 P.
Mean tri-daily reduced,	29.782
Monthly range,	1.41

****Air Temperature.*** In Degrees Fahr.

Highest,	54.0, 27th, 2 P.
Lowest,	5.0, 6th, 6 A.
Mean hourly,	25.5
Mean of means of max. and min.,	25.3
Mean sensible (wet bulb),	23.1
Monthly range,	49.0
Highest mean daily,	42.3, 27th.
Lowest mean daily,	13.5, 5th.
Mean maximum,	33.3
Mean minimum,	17.2
Mean daily range,	16.1
Greatest daily range,	33.0, 23d.
Least daily range,	3.5, 17th.

Humidity.

Mean dew point,	15.1
Mean force of vapor,	.152
Mean relative humidity,	66.8

Precipitation. In inches.

Total precipitation,	3.54
Number of days on which .01 inch or more rain or melted snow fell,	10
Snow, total in inches,	8.25
Snow on ground at end of month.	0

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5199m.
Greatest daily movement,	505 m., 3d.
Least daily movement,	35m., 12th.
Mean daily movement,	185.7 m.
Mean hourly velocity,	7.7 m.
Maximum pressure per square foot, 24.0 lbs.= 69 m. per hour, 3d, 4 P., N.N.W.	
Prevailing Direction, Northeast.	

Summary.

Northeast,	14 per cent.
North Northeast,	21 " "
East Northeast,	29 " "
Other directions.	36 " "

Weather.

Mean cloudiness observed,	63 per cent.
Total cloudiness recorded by the Sun Thermometer,	158 hrs.=53 per cent.
Number of clear days,	10
Number of fair days,	6
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, 138 hrs.=47%

Rain, 1st, 2d, 25th, 26th, 28th.

Snow, 1st, 2d, 3d. 4th, 13th, 17th. 21st, 22d.

Gales, 35 miles or more per hour, 60m., 2d, N.N.W.; 69m., 3d, N.N.W.; 44m., 8th, N.; 40m., 17th, E.; 43m., 18th, N.N.E.; 38m., 19th, N.N.E.

No. days sleighing, 3

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.27	30.03	30.182	29.0	3 P	20.5	8 A	24.7	24.5	24.8	0
2	30.03	28.86	29.250	36.0	2 P	27.0	12 P	31.5	32.3	32.3	0
3	29.71	29.02	29.492	26.0	0 A	18.0	12 P	22.0	23.2	20.5	0
4	29.80	29.67	29.743	20.0	2 P	12.0	7 A	16.0	15.6	12.8	5
5	30.07	29.80	29.971	22.0	3 P	7.5	6 A	14.7	13.5	11.0	8
6	30.11	29.97	30.028	27.0	3 P	5.0	6 A	16.0	15.5	12.8	10
7	29 97	29.65	29.730	30.0	3 P	8.5	8 A	19.3	18.3	16.5	7
8	29 65	29.29	29 390	22.0	9 P	15.0	6:30 A	18.5	19.1	16.7	2
9	29.57	29.27	29 449	32.5	12 M	21.0	0 A	26 7	27.5	24.8	4
10	29.74	29.57	29.636	31.0	2 P	15.0	12 P	23.0	24.3	20.5	10
11	29 79	29 74	29.770	26.5	2:30 P	10.0	7:30 A	18.3	18.3	15.3	9
12	29.77	29.68	29.739	31.0	3 P	9.5	6:30 A	20.3	20.9	18.2	6
13	29.88	29.77	29.820	31.0	2:30 P	18.0	8 A	24.5	23.6	20.5	5
14	30.12	29.88	30.059	36.0	3:30 P	20.0	7:30 A	28.0	26.4	22.8	8
15	30.17	30 11	30.137	39 0	3 P	11.5	7:30 A	25.3	26.2	20.2	10
16	30.22	29 90	30.080	36.5	2:30 P	11.0	7:30 A	23.7	25.5	22.0	9
17	29 90	28 86	29 129	29.0	6:30 A	25 5	3:30 P	27.3	26.8	26.0	0
18	29 38	28.87	29 130	29 0	2 P	19.0	12 P	24.0	25.0	21.3	5
19	30.02	29.38	29 755	25.0	5 P	13.0	6 A	19.0	18.8	16.0	8
20	30.21	30 02	30.178	40.0	3 P	10.0	6 A	25.0	25.3	21.5	10
21	30.19	29 92	30.088	29.5	2 P	12.0	6 A	20.7	23.3	23.5	2
22	29.92	29 78	29 803	33.0	2 P	25.0	12 P	29.0	29.5	27.7	0
23	30.11	29 85	30 005	45.0	2:30 P	12.0	6:30 A	28.5	27.6	21.2	11
24	30.18	30.09	30.133	40.0	3 P	8.0	7:30 A	24.0	26.7	25.3	6
25	30.14	29.90	30.050	43 0	6 P	30.5	8 A	36.7	36.0	35.2	0
26	29.90	29 58	29.642	45.0	2:30 P	35.0	5 A	40.0	39.6	39.5	0
27	29.85	29.67	29.778	54.0	2 P	31.0	8 A	42.5	42.3	40.0	3
28	29.89	29.46	29.728	45.5	1 P	30.5	6:30 A	38.0	38.2	38.2	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	22.3	.142	86.0	E.N.E.	105	0.0	—	—	0 A	12 P	.10	0.5
2	30.0	.193	86.7	E.N.E.	197	18.0	60	8:30 P	0 A	12 P	.90	T.
3	12.3	.127	63.3	N N.E.	505	24.0	69	4 P	0 A	2 P	.01	T.
4	5.7	.089	68.0	W.N.W.	155	2.0	20	2 A	2 P	5 P	.01	.25
5	0.0	.085	57.0	N.E.	115	0.5	10	6 P				
6	-3.7	.100	41.3	N.N.E.	48	0.0	—	—				
7	6.7	.112	60.3	N.N.E.	67	2.0	20	5 P				
8	7.0	.108	58.7	N.E.	255	9.5	44	4 P				
9	19.0	.150	72.0	N.E.	295	5.5	33	2 A				
10	10.7	.132	57.0	N.N.E.	217	4.5	30	1 P				
11	3.0	.108	53.3	N.	183	4.5	30	11 A				
12	8.3	.123	60.0	W.	35	0.0	—	—				
13	13.0	.128	65.3	E.N.E.	215	4.0	28	6 P	8 P	11 P		T.
14	13.0	.147	59.3	N.N.E	304	4.5	30	10 A				
15	7.3	.146	53.7	E.N.E.	67	1.0	14	6 P				
16	12.3	.172	59.0	N.W.	68	0.5	10	3 A				
17	22.0	.150	81.3	E.N.E.	391	8.0	40	4 A	6 A	12 P	.22	3.0
18	10.0	.137	55.0	N.N.E.	380	9.0	43	11 A				
19	6.3	.105	58.0	N.N.E.	320	7.0	38	3 P				
20	5.3	.152	41.7	N.E.	138	4.5	30	9 A				
21	20.3	.137	85.7	E N.E.	42	0 5	10	1 P	12 M	12 P	.29	3.0
22	23.0	.165	76.7	E.	340	4.5	30	3 P	0 A	2 P	.14	1.5
23	5.3	.164	50.3	N.W.	71	0.5	10	9 P				
24	20.0	.170	72.7	W.S.W.	129	2.5	22	1 P				
25	32.3	.221	84.7	E.S.E.	85	1.0	14	10 P	8 P	12 P	.01	
26	36.7	.259	86.7	E.N.E.	286	3.5	26	10 A	2 A	6 A	.19	
27	38.0	.289	85.0	N.	65	0.0	—	—				
28	36.3	.244	90.3	S.	121	2.5	22	3 P	4 P	12 P	1.67	

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The weather for the month while seasonable in most respects showed a number of marked departures from the normals in the records of the various elements. Some of these departures, notably those of atmospheric pressure, dew point and snow fall, corresponded with the same abnormal features of a year ago.

The mean barometer was about a quarter of an inch below the normal and established a new low mean record at this station. It differed but little however from the February record of last year. The maximum occurring on the 1st and one of the minimums on the 2d shows a rapidity of change not often noted. The second large fluctuation culminated in the low record of the 17th. During the last week the chart record showed the pressure very unsteady although the changes of pressure were small. The total wind movement was nearly ten per cent less than usual although a number of unusually large daily records were made. The daily prevailing direction of the wind was from the northeast quadrant on twenty days of the month, a most unusual feature here.

The mean temperature was about a degree above the normal, and the minimum record above zero for the first time since 1890. The range was about ten degrees less than usual. The mean dew point was unusually low and the relative humidity ten points below the normal.

The total precipitation was slightly above the average, most of it occurring as rain. Nearly one-half the total fell on the last day of the month after 4 P. M., in a very heavy shower. The snow fall was small and soon melted giving but three days sleighing compared with sixteen days sleighing last year for about the same amount of snow. The month closed with the ground bare and the frost all out in places.

J. E. OSTRANDER, Meteorologist.

H. L. BODFISH, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 159. MARCH, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.19, 15th, 7 A.
Minimum reduced to freezing,	28.65, 2d, 4:30 P.
Reduced† maximum reading,	30.50, 15th, 7 A.
Reduced† minimum reading,	28.95, 2d, 4:30 P.
Mean tri-daily reduced,	29.911
Monthly range,	1.55

****Air Temperature.*** In Degrees Fahr.

Highest,	65.0, 22d, 3 P., 30th, 3 P.
Lowest,	16.5, 7th, 6 A.
Mean hourly,	40.5
Mean of means of max. and min.,	40.5
Mean sensible (wet bulb),	37.5
Monthly range,	48.5
Highest mean daily,	53.5, 30th.
Lowest mean daily,	26.0, 19th.
Mean maximum,	49.5
Mean minimum,	31.6
Mean daily range,	17.9
Greatest daily range,	34.0, 26th.
Least daily range,	5.0, 5th, 9th.

Humidity.

Mean dew point,	32.2
Mean force of vapor,	.275
Mean relative humidity,	72.3

Precipitation. In inches.

Total precipitation,	5.29
Number of days on which .01 inch or more rain or melted snow fell,	16
Snow, total in inches,	9.75
Snow on ground at end of month,	0

Wind.

Total movement,	6601m.
Greatest daily movement,	596 m., 19th.
Least daily movement,	56m., 26th.
Mean daily movement,	212.9 m.
Mean hourly velocity,	8.9 m.
Maximum pressure per square foot, 24.0 lbs.= 69 m. per hour, 19th, 3 P., E.N.E.	
Prevailing Direction, North.	

Summary.

Northeast,	13 per cent.
West,	16 " "
West Southwest,	13 " "
East Northeast,	29 " "
Other directions,	29 " "

Weather.

Mean cloudiness observed,	66 per cent.
Total cloudiness recorded by the Sun Thermometer,	227 hrs.=61 per cent.
Number of clear days,	5
Number of fair days,	12
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded,	143 hrs.=39%
Rain,	1st, 2d, 8th, 9th, 11th, 13th, 16th, 17th, 19th, 20th, 27th, 28th, 29th, 30th, 31st.
Snow,	5th, 8th, 9th, 19th, 31st.
Gales,	35 miles or more per hour, 35m., 2d, W.N.W.; 36m., 3d, N.W.; 41m., 6th, E.N.E.; 42m., 16th, W.; 40m., 18th, E.N.E.; 69m., 19th, E.N.E.
No. days sleighing,	3

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.74	29.36	29.629	58.0	4 P	41.0	12 P	49.5	47.7	45.8	5
2	29.73	28.95	29.252	55.0	2 P	35.5	5 A	45.3	42.2	43.7	0
3	29.65	29.24	29.535	43.0	0 A	33.5	12 P	38.3	38.9	34.8	2
4	30.00	29.65	29.855	36.5	2:30 P	28.5	12 P	32.5	32.4	29.3	2
5	30.03	29.49	29.799	30.0	12 M	25.0	6 P	27.5	27.3	25.0	0
6	30.18	29.49	29.932	39.5	4 P	20.0	12 P	29.7	29.0	24.8	11
7	30.31	30.18	30.233	46.5	4 P	16.5	6 A	31.5	32.4	30.0	8
8	30.47	30.31	30.374	41.0	2 P	31.5	6 A	36.3	35.9	32.8	1
9	30.33	29.94	30.017	37.0	4 P	32.0	3 A	34.5	35.1	34.7	0
10	30.32	29.97	30.156	45.0	3 P	32.0	12 P	38.5	38.9	34.8	7
11	30 38	30.14	30.264	47.0	2 P	25.0	6 A	36.0	37.3	35.7	6
12	30.14	29.71	29.879	61.5	2:30 P	38.0	0 A	49.7	49.3	46.3	6
13	29.85	29.49	29.592	61.5	3 P	39.0	12 P	50.3	50.2	47.8	2
14	30.45	29.85	30.289	50.0	3 P	30.0	12 P	40.0	38 5	32.0	12
15	30.50	30 42	30.457	53.0	3 P	23.0	6 A	38.0	38.4	34.4	6
16	30.44	29.89	30.186	55.0	12 P	35.0	8 A	45.0	43.7	44.2	0
17	29.94	29.82	29.915	55.0	0 A	37.0	12 P	46.0	45.2	39.5	0
18	30.01	28.86	29.951	37.0	0 A	23.0	12 P	30.0	30.6	26.3	2
19	29.86	29.35	29.570	30.0	10 A	22.5	2:30 P	26.3	26.0	24.3	0
20	29.75	29.65	29.704	41.5	12 M	28.5	0 A	35.0	35.3	34.7	2
21	29.89	29.71	29.823	54.5	3 P	35.0	0 A	44.7	44.7	41.5	6
22	29.97	29.85	29.914	65.0	3 P	41.0	6 A	53.0	52.7	45.7	6
23	29.99	29.91	29.956	61.0	4 P	38.5	6 A	49.7	50.5	44.3	12
24	30.06	29 95	29 997	46.0	4 P	27.0	6 A	36.5	38.5	34.8	7
25	30.22	30.06	30.128	54 0	3 P	28.0	6 A	41.0	41.3	36.3	10
26	30.34	30.22	30.280	59.0	4 P	25.0	6 A	42.0	42.0	36.8	12
27	30.28	30.05	30.135	56.0	2:30 P	28 0	6 A	42.0	41.8	38.7	6
28	30.05	29.86	29.960	48 0	12 P	37 0	5 A	42.5	43.2	43.3	0
29	29.86	29.47	29.551	54.0	2 P	47 0	0 A	50.5	51.5	51.2	0
30	29.66	29.47	29.552	65 0	3 P	43.0	3 A	54.0	53.5	49.3	7
31	29.47	29.28	29.348	48 0	0 A	34.0	12 P	41.0	43.0	39.8	5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	42.7	.355	78.7	W.	210	5.5	33	4 A	0 A	3 A	.17	
2	45.0	.312	88.0	W.S.W.	188	6.0	35	9 P	7 A	10 P	.96	
3	29.3	.297	71.7	N.N.W.	305	6.5	36	1 A				
4	23.0	.186	67.0	N.	202	3.0	24	6 A				
5	19.7	.149	73.3	E.N.E.	258	4.5	30	11 P	11:30A	11 P	.81	8.0
6	14.7	.162	56.7	E.N.E.	400	8.5	41	9:30 A				
7	22.0	.214	62.3	W.	100	0.0	—	—				
8	27.0	.215	69.3	E.S.E.	105	0.0	—	—	9 P	12 P	.04	.5
9	32.3	.212	86.3	E.N.E.	155	1.0	14	11 P	0 A	3 P	1.16	1.0
10	28.3	.237	67.3	N.E.	246	2.5	22	4 P				
11	30.3	.246	73.0	W.N.W.	146	3.0	24	6 P	9 P	9:30 P	.01	
12	41.7	.387	71.7	W.S.W.	225	1.5	17	4 P				
13	44.0	.387	78 0	W.	274	4.0	28	11 P	11:30 P	12 P	.05	
14	22.7	.227	56.3	E.N.E.	305	4.5	30	2 A				
15	27.3	.246	67.0	N.W.	64	0.5	10	4 P				
16	42.7	.315	91.0	S.W.	120	9.0	42	12 P	10 A	12 P	.25	
17	33.7	.284	69.7	S.S.E.	220	1.5	17	4 P	0 A	1 P	.59	
18	19.3	.162	67.3	N.E.	324	8.0	40	7 P				
19	17.7	.146	71.0	E.N.E.	596	24.0	69	3 P	8 A	6 P	.01	.25
20	32.3	.214	84.7	N.E.	209	1.0	14	2 P	11 P	11 P	.14	
21	36.3	.312	72.0	E.N.E.	202	4.5	30	2 P				
22	38.3	.409	62.3	E.N.E.	236	3.5	26	8 A				
23	37.7	.373	64.7	N.E.	118	1.5	17	12 M				
24	29.0	.237	69.3	E.N.E.	205	4.5	30	1 P				
25	28.7	.271	61.3	E.N.E.	198	2.5	22	8 A				
26	28.3	.285	61.7	W.	52	1.5	17	7 P				
27	31.7	.298	64.0	W.S.W.	268	4.0	28	6 P	6:30 P	10 P	.02	
28	42.3	.291	93.3	W.	141	1.0	14	2 A	10:30A	12 P	.42	
29	50.3	.388	94.7	W.S.W.	282	5 0	32	11 A	0 A	9 P	.54	
30	44.7	.434	70.7	N.	100	3.0	24	1 A	11:30 P	12 P	.06	
31	36.0	.278	78.3	N.N.W.	147	4.0	28	2:30 P	0 A	7 P	.06	T.

*Rain or melted snowat base of tower. **Included in following day.

REMARKS.

The weather for March was seasonable in many respects. High winds, frequent rains and much cloudiness were noticeable features. But one snowfall of any amount occurred and it melted in a few days.

The frost began to leave the ground early in the month and was practically all out when the month closed. The large amount of mild weather has placed the season fully a week earlier than usual.

The mean barometer was considerably below the normal and the range unusually large. Fluctuations of unusual magnitude and extending over several days were the rule rather than the exception. A reduced minimum of 28.95 inches for March has been noted but once before at this station.

The total wind movement was nearly 20 per cent more than usual, most of it coming from the northeast quadrant. The daily record of the 19th, of 596 miles has seldom been equalled here.

The mean temperature was nearly 8 degrees above the normal and was the most important departure from usual conditions for the month. The maximum and minimum were both unusually high. The mean daily records from the hourly readings were above 40 degrees on 16 days and were below freezing on but 4 days. The mean dew point was over 7 degrees higher than usual while the relative humidity was about normal.

The total precipitation was about 40 per cent more than usual and was well distributed throughout the month. No unusually heavy rains occurred.

The month closed with the roads in fair condition and spring plowing begun on the higher ground.

J. E. OSTRANDER, Meteorologist.

H. L. BODFISH, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 160. APRIL, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.98, 25th, 7 A.
Minimum reduced to freezing,	28.93, 1st, 4 A.
Reduced† maximum reading,	30.28, 25th, 7 A.
Reduced† minimum reading,	29.24, 1st, 4 A.
Mean tri-daily reduced,	29.876
Monthly range,	1.04

****Air Temperature.*** In Degrees Fahr.

Highest,	83.0, 22d, 3 P.
Lowest,	25.5, 15th, 6 A.
Mean hourly,	47.3
Mean of means of max. and min.,	47.2
Mean sensible (wet bulb),	42.7
Monthly range,	57.5
Highest mean daily,	63.3, 22d
Lowest mean daily,	38.3, 1st
Mean maximum,	57.9
Mean minimum,	36.5
Mean daily range,	21.4
Greatest daily range,	41.0, 23d
Least daily range,	7.0, 8th

Humidity.

Mean dew point,	36.3
Mean force of vapor,	.353
Mean relative humidity,	67.1

Precipitation. In inches.

Total precipitation,	3.31
Number of days on which .01 inch or more rain or melted snow fell,	13
Snow, total in inches,	T.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4642m.
Greatest daily movement,	364m., 2d.
Least daily movement,	24m., 4th.
Mean daily movement,	154.7 m.
Mean hourly velocity,	6.4 m.
Maximum pressure per square foot, 14.0 lbs.= 53 m. per hour, 27th, 11 A., N.W.	
Prevailing Direction, Northwest.	

Summary.

North,	10 per cent.
North, Northeast,	10 " "
Southeast,	10 " "
Southwest,	10 " "
West Southwest,	13 " "
West,	10 " "
Other directions,	37 " "

Weather.

Mean cloudiness observed,	68 per cent.
Total cloudiness recorded by the Sun Thermometer, 263 hrs.=65 per cent.	
Number of clear days,	3
Number of fair days,	10
Number of cloudy days,	17

Bright Sunshine.

Number of hours recorded,	139 hrs.=35%

Rain, 1st, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 18th, 20th, 21st, 23d, 25th, 26th, 27th, 29th, 30th.

Snow, 2d

Thunder and Lightning, 26th, 30th.

Gales, 35 miles or more per hour, 35m., 1st, N.N.W.; 37m., 2d, N.N.W.; 45m., 8th, E.S.E.; 40m., 9th, S.E.; 35m., 23d, N. N.E.; 39m., 24th, N.N.E.; 53m., 27th, N. W.; 36m., 29th, W.N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.34	29.24	29.290	47.0	3 P	26.5	6 A	36.7	38.3	36.0	4
2	29.63	29.34	29.491	45.0	3:30 P	37.0	4 A	41.0	40.2	36.5	0
3	29.98	29.63	29.798	45.0	3 P	33.5	6 A	39.3	38.9	34.7	3
4	30.03	29.90	29.961	53.0	3 P	27.0	6 A	40.0	41.5	37.3	6
5	29.90	29.82	29.875	50.0	4 P	37.5	6 A	43.7	44.6	39.7	4
6	29.95	29.82	29.897	60.0	3 P	36.0	6 A	48.0	46.7	41.3	8
7	30.11	29.93	30.041	47.0	4 P	38.0	6 A	42.5	41.7	39.3	0
8	30.10	29.64	29.918	45.0	1 P	38.0	7 A	41.5	41.3	40.2	0
9	29.64	29.48	29.542	48.5	7:30 A	38.0	12 P	43.3	43.8	43.3	1
10	29.75	29.59	29.671	43.0	4 P	34.0	10 P	38.5	39.0	37.3	1
11	29.76	29.71	29.755	50.0	5 P	35.0	0 A	42.5	42.4	39.7	6
12	29.71	29.59	29.661	58.0	11 A	35.0	5 A	46.5	46.0	42.2	3
13	29.81	29.66	29.715	52.0	3 P	36.0	5 A	44.0	44.5	40.7	2
14	30.04	29.81	29.951	48.0	5 P	32.0	12 P	40.0	42.4	37.3	2
15	30.14	30.00	30.107	60.0	4 P	25.5	6 A	42.7	45.0	37.8	13
16	30.10	29.96	30.025	59.0	1 P	29.0	6 A	44.0	47.8	40.2	6
17	29.96	29.80	29.895	63.0	4 P	32.0	6 A	47.5	48.8	41.3	6
18	30.03	29.90	29.957	60.0	4 P	36.5	2 A	48.3	47.4	42.7	6
19	30.07	29.95	30.020	62.0	3 P	37.0	6 A	49.5	46.8	42.0	3
20	30.05	29.94	30.000	62.0	3 P	36.5	6 A	49.3	49.2	43.2	3
21	30.05	29.93	29.986	66.0	4 P	42.0	5 A	54.0	54.8	49.7	2
22	29.96	29.80	29.860	83.0	3 P	48.0	6 A	65.5	63.3	57.2	6
23	29.94	29.63	29.820	81.0	3 P	40.0	6 A	60.5	57.4	52.3	6
24	30.17	29.89	30.070	57.0	2 P	40.5	6 A	48.7	50.5	42.0	12
25	30.28	30.13	30.202	60.0	1:30 P	30.5	6 A	45.3	49.3	42.5	7
26	30.14	29.50	29.695	58.0	9 P	42.5	6 A	50.3	47.9	47.5	0
27	29.99	29.53	29.772	57.0	0 A	47.0	5 P	52.0	51.5	43.8	4
28	30.19	29.99	30.110	73.0	5 P	38.0	6 A	55.5	56.6	47.5	13
29	30.26	30.15	30.208	75.0	12 M	37.0	5 A	56.0	56.1	51.2	8
30	30.15	29.93	29.974	70.0	6 P	49.0	1 A	59.5	56.7	56.5	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	30.7	.244	74.0	N.W.	125	6.0	35	2 P	5:30 P	10 P	.02	
2	29.7	.252	68.0	N.N.W.	364	7.0	37	10 A	7:30A			T.
3	27.7	.239	64.7	N.	253	4.5	30	4 P				
4	30.7	.278	65.0	N.W.	24	0.0	—	—				
5	32.0	.295	62.5	E.S.E.	189	1.5	17	10 A				
6	32.7	.338	59.0	W.S.W.	113	1.5	17	3 P	10:30 P	12 P	.02	
7	35.0	.273	76.0	S.E.	94	0.5	10	3 P	0 A	12 M	.09	
8	37.7	.266	85.0	E.	268	10.0	45	4 P	10 A	12 P	.23	
9	41.7	.299	89.0	S.E.	326	8.0	40	1 A	0 A	4 P	.55	
10	33.7	.245	79.7	E.N.E.	117	2.5	22	12 P	0 A	4 P	.25	
11	35.0	.281	75.0	N.N.E.	73	0.0	—	—	6 A	12 P	.05	
12	37.3	.316	74.3	E.	111	4.5	30	7 P	0 A	3 A	.03	
13	34.3	.300	69.0	N.	156	5.0	32	4 P	5:30 A	7 A	.03	
14	35.0	.261	69.0	N.N.E.	202	2.5	22	2 P				
15	25.3	.331	50.7	N.E.	54	0.0	—	—				
16	29.0	.347	50.7	S.W.	63	0.5	10	4 P				
17	32.3	.352	60.3	S.W.	75	1.5	17	10 P				
18	35.3	.350	66.7	S.	87	1.0	14	6 P	3 P		T.	
19	34.0	.356	61.0	W.	150	2.0	20	5 P				
20	36.3	.364	63.7	W.	211	3.5	26	1 P	6 P		T.	
21	43.3	.472	63.3	W.S.W.	122	0.5	10	9 P	3 P	3:30 P	T.	
22	51.7	.662	62.3	S.W.	145	2.0	20	10 P				
23	48.0	.535	72.3	W.N.W.	105	6.0	35	8 P	3 P		T.	
24	31.0	.368	49.7	N.N.E.	315	7.5	39	3 P				
25	31.7	.379	51.7	W.	100	1.0	14	12 M	7 P		T.	
26	46.0	.360	88.0	S.E.	140	2.5	22	7 P	2 A	12 P	.15	
27	36.0	.365	58.3	N.	275	14.0	53	11 A	0 A	3 A	.02	
28	38.0	.470	53.0	N.E.	82	3.5	26	1: 30 P				
29	45.3	.487	68.3	W.S.W.	106	6.5	36	12 M	7 P	12 P	.62	
30	53.7	.503	83.7	W.S.W.	197	3.5	26	5 A	0 A	11 P	1.25	

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The early spring expected as a result of the mild March weather failed to materialize during April. The season's progress during the greater portion of the month was very slow and not until the last third of the month did the progress become normal. When the month closed the foliage and grass were well started and the season about normal.

The most noticeable features of the weather during the month were the large amount of cloudiness, and the small precipitation, up to nearly the close of the month.

A comparison of the records with the normals for this station shows an unusually low mean barometer and low maximum. The range was about normal and the fluctuations generally slow. The total wind movement was about 10 per cent. less that usual although several gales were noted.

The mean temperature was about a degree above the normal, with both the maximum and minimum abnormally high. The mean dew point and relative humidity were both slightly higher than usual.

The total precipitation was about half an inch above the normal, more than one half of it falling on the 29th and 30th. Unusually severe thunder and lightning occurred on the night of the 30th with considerable precipitation. The amount of sunshine was much below the average, there being but three clear days during the month.

Only a single light frost was noted during the latter part of the month and none of the buds have as yet been injured.

J. E. OSTRANDER, Meteorologist.

H. L. BODFISH, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 161. MAY, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.14, 31st, 9 A.
Minimum reduced to freezing,	29.21, 27th, 6 P.
Reduced† maximum reading,	30.43, 31st, 9 A.
Reduced† minimum reading,	29.49, 27th, 6 P.
Mean tri-daily reduced,	29.939
Monthly range,	.94

****Air Temperature.*** In Degrees Fahr.

Highest,	91.0, 23d, 4 P.
Lowest,	30.0, 10th, 5 A., 12th, 5 A.
Mean hourly,	57.0
Mean of means of max. and min.,	56.6
Mean sensible (wet bulb),	50.8
Monthly range,	61.0
Highest mean daily,	73.9, 23d, 24th
Lowest mean daily,	41.7, 10th
Mean maximum,	69.3
Mean minimum,	43.9
Mean daily range,	25.4
Greatest daily range,	44.0, 18th
Least daily range,	8.5, 3d

Humidity.

Mean dew point,	44.0
Mean force of vapor,	.512
Mean relative humidity,	63.4

Precipitation. In inches.

Total precipitation,	2.32
Number of days on which .01 inch or more rain or melted snow fell,	8

Wind.

Total movement,	4328m.
Greatest daily movement,	341m., 9th.
Least daily movement,	18m., 19th.
Mean daily movement,	139.6 m.
Mean hourly velocity,	5.8 m.
Maximum pressure per square foot, 10.0 lbs.= 45 m. per hour, 9th, 3 P., N.	
Prevailing Direction, North, Northwest.	

Summary.

North,	23 per cent.
North, Northeast,	13 " "
Northeast,	13 " "
West,	13 " "
Northwest,	10 " "
Other directions,	28 " "

Weather.

Mean cloudiness observed,	58 per cent.
Total cloudiness recorded by the Sun Thermometer,	243 hrs.=54 per cent.
Number of clear days,	6
Number of fair days,	9
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, . . . 210 hrs.=46%

Rain, 3d, 4th, 5th, 14th, 19th, 24th, 25th, 26th, 27th, 28th, 29th, 30th.

Frosts, 12th, 14th.

Thunder and Lightning, 4th, 24th, 26th, 27th.

Gales. 35 miles or more per hour, 35m., 8th, N.; 45m., 9th, N.; 35m., 24th, W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.08	29.97	29.993	60.0	3 P	46.0	5 A	53.0	53.5	48.2	3
2	30.14	29.99	30.095	73.0	6 P	40.5	5 A	56.7	57.3	49.0	13
3	30.14	30.01	30.071	51.5	3 P	43.0	12 P	47.3	48.6	46.3	0
4	30.19	30.00	30.102	63.0	3 P	36.0	5 A	49.5	51.6	48.3	4
5	30.03	29.88	29.944	70.0	4 P	48.0	4 A	59.0	55.8	53 0	3
6	30.16	29.98	30.081	74.0	3 P	45.0	5:30 A	59.5	59.8	52.0	10
7	30.01	29.62	29.747	72.0	2 P	49.5	3 A	60.7	58.3	55.5	5
8	29 88	29.76	29.836	70.0	3 P	47.0	5 A	58.5	59.6	52.2	4
9	29.94	29.59	29.746	62.0	7:30 A	39.0	12 P	50.5	50.1	43.0	10
10	30.15	30.02	30.061	52.0	4 P	30.0	5 A	41.0	41.7	35.5	5
11	30 20	30.10	30.154	64.0	4 P	32.0	5 A	48.0	48.4	40.5	14
12	30.26	30.02	30.128	67.0	1 P	30.0	5 A	48.5	50.4	46.2	7
13	30.02	29.87	29.965	69.0	3 P	46.5	5 A	57.7	55.2	46.3	9
14	30.06	29.91	29 989	68.0	4:30 P	32.0	5 A	50.0	52.7	43.2	14
15	30.15	30.01	30.109	67.0	5 P	44.0	4 A	55.5	55.4	46.0	9
16	30.15	29 90	30.017	75.0	4 P	37.5	5 A	56.3	59.7	49.7	9
17	29.93	29.80	29.880	77.0	3 P	50.0	4 A	63.5	64.3	52.3	14
18	29.97	29.85	29.922	82.0	4 P	38.0	5 A	60.0	62.2	51.2	14
19	30.01	29.81	29.909	58.0	12 M	49.0	5 A	53.5	53.2	52 0	0
20	30.21	29.81	29.990	73.0	3 P	45.0	5 A	59.0	59 1	51.8	5
21	30.34	30.15	30.241	74.0	4 P	35.5	5 A	54.7	56.7	49.3	10
22	30.17	29.89	30.022	82.0	1 P	42.0	5 A	62.0	62.7	56.7	7
23	29.89	29.76	29.806	91.0	4 P	55.0	5 A	73.0	73.9	66.3	6
24	29.81	29.63	29.733	87.0	2 P	66.0	12 P	76.5	73.9	67.3	4
25	29.81	29.68	29.764	77.0	2 P	61.0	5 A	69.0	69.5	65.0	4
26	29.68	29 61	29.636	76.0	2:30 P	57.0	12 P	66.5	64.9	61.3	4
27	29 69	29.49	29.552	62.5	1 P	49.0	12 P	55.7	57.2	56.0	1
28	29.79	29.52	29.649	49.0	0 A	39.0	10 P	44.0	45.8	42.0	0
29	29.99	29.79	29.890	61.0	3 P	40.0	4 A	50.5	50.6	44.7	5
30	30.25	29.90	29.688	65.0	2:30 P	43.5	4 A	54.3	55.1	50.8	2
31	30.43	30.25	30.398	77.0	4 P	43.5	4 A	60.3	60.2	52.2	15

DAILY SUMMARY.

Day.	Humidity.			Wind.				Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	43.3	.409	70.0	N.E.	208	3.5	26	4:30 P				
2	39.3	.491	54.7	N.	112	2.0	20	1 A				
3	43.3	.349	81.0	S.	129	0.0	—	—	2 A	12 M	.09	
4	44.3	.418	74.3	W.	71	2.0	20	11 P	4 P	6 P	T.	
5	50.3	.460	80.7	W.	190	2.5	22	6 P	10 P	12 P	.05	
6	44.0	.558	54.7	N.	70	1.5	17	6 P				
7	51.7	.549	73.0	W.N.W.	253	4.0	28	10 P				
8	44.7	.539	56.7	N.N.E.	170	6.0	35	5 P				
9	32.7	.382	50.3	N.N.E.	341	10.0	45	3 P				
10	24.7	.275	52.0	N.N.E.	263	2.5	22	12 M				
11	28.7	.357	47.3	N.	49	1.0	14	8 A				
12	40.0	.414	65.3	S.W.	115	3 0	24	6 P				
13	36.0	.445	52.3	N.	160	2 5	22	11 P				
14	31.3	.432	43.0	N.E.	109	0.5	10	6 P	9:30 P		T.	
15	36.7	.438	52.3	N.N.E.	64	1.5	17	10 A				
16	40.3	.572	57.7	N.	136	2.5	22	1 P				
17	42.0	.610	46.0	N.E.	96	1.5	17	3 P				
18	40 7	.603	50.3	N.	46	0.0	—	—				
19	49.7	.424	85.0	W.	18	0.0	—	—	7:30 A	10 P	.30	
20	44.0	.523	60.7	N.E.	168	5.0	32	8 P				
21	40.3	.515	53.7	N.W.	84	0.5	10	5 P				
22	50.0	.682	59.7	W.S.W.	168	2.5	22	6 P				
23	61.7	.928	63.7	N.W.	191	2.0	20	3 P				
24	63.7	.891	72.3	W.	113	6.0	35	5 P	5 A	11 P	.22	
25	62.0	.757	75.0	W.S.W.	68	1.0	14	1 A	7:30 P	12 P	.13	
26	59.0	.649	80.0	W.N.W.	171	4 5	30	11 A	0 A	5 P	.55	
27	54.3	.490	87.7	N.	88	0.5	10	11 P	5 A	10 P	.93	
28	38.3	.301	78.0	N.N.W.	183	3.0	24	5 P	8 A	5 P	T.	
29	36.7	.390	58.7	N.N.W.	215	5.0	32	3 P	8 A		T.	
30	46.7	.449	72.3	N.W.	181	3.0	24	2 P	4 A	5 A	.05	
31	44.0	.558	56.3	S.E.	98	0.5	10	10 A				

*Rain or melted snowat base of tower. **Included in following day.

REMARKS.

The weather during May was generally pleasant and the season made good progress. The heavy rainfall on the last of April did much toward bringing out the foliage and helping along vegetation during the early part of May. The lack of sufficient moisture was however apparent by the middle of the month, and not until the last week was the precipitation sufficient to furnish the needed relief.

The mean barometric pressure was slightly below the normal and the range a little more than usual. The pressure was very unsteady although the fluctuations were generally small. The total wind movement was a little less than normal and most of it came from the north quadrant. The gales were few and light.

The mean temperature was normal but the range was large owing to a rather high maximum. The second week was cool and frosts were noted but no damage to the fruit trees has been reported. The low temperature on the 28th and 29th caused considerable apprehension to the tobacco growers, but the minimum was well above the freezing point and no damage was done in this vicinity.

Less than half an inch of rain fell before the 24th. While the last week was generally stormy the total precipitation for the month was but little more than half the normal. The total precipitation for the first five months of the year shows a deficiency of about an inch.

J. E. OSTRANDER, Meteorologist.

H. L. BODFISH, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 162. JUNE, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.17, 1st, 7 A.
Minimum reduced to freezing,	28.95, 26th, 10 A.
Reduced† maximum reading,	30.46, 1st, 7 A.
Reduced† minimum reading,	29.24, 26th, 10 A.
Mean tri-daily reduced,	29.837
Monthly range,	1.22

****Air Temperature.*** In Degrees Fahr.

Highest,	89.0, 3d, 3 P.
Lowest,	40.0, 6th, 4 A.
Mean hourly,	63.5
Mean of means of max. and min.,	63.1
Mean sensible (wet bulb),	58.2
Monthly range,	49.0
Highest mean daily,	72.1, 16th
Lowest mean daily,	55.4, 21st
Mean maximum,	74.3
Mean minimum,	51.9
Mean daily range,	22.4
Greatest daily range,	35.0, 2d
Least daily range,	6.0, 21st

Humidity.

Mean dew point,	53.5
Mean force of vapor,	.621
Mean relative humidity,	70.8

Precipitation. In inches.

Total precipitation,	4.54
Number of days on which .01 inch or more rain or melted snow fell,	13

Wind.

Total movement,	4102m.
Greatest daily movement,	295m., 27th.
Least daily movement,	42m., 13th.
Mean daily movement,	137 m.
Mean hourly velocity,	5.7 m.
Maximum pressure per square foot,	15.0 lbs.= 55 m. per hour, 26th, 2 P., N.
Prevailing Direction,	Northwest.

Summary.

North,	20 per cent.
North, Northeast,	10 " "
West, Southwest,	10 " "
West,	13 " "
Northwest,	17 " "
Other directions,	30 " "

Weather.

Mean cloudiness observed,	62 per cent.
Total cloudiness recorded by the Sun Thermometer,	278 hrs.=61 per cent.
Number of clear days,	4
Number of fair days,	10
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, 179 hrs.=39%

Rain, 2d, 3d, 4th, 7th, 8th, 10th, 13th, 15th, 16th, 19th, 21st, 23d, 24th, 26th, 29th, 30th.

Thunder and Lightning, 3d. 13th, 16th.

Gales, 35 miles or more per hour, 50m., 3d, E.N.E.; 39m., 8th, W.; 36m., 12th, N.; 35m., 16th, W.; 35m., 17th, N.N.E.; 55m., 26th, N.; 36m., 27th, N.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.46	30.29	30.361	80.0	3 P	47.0	5 A	63.5	63.8	58.3	8
2	30.29	29.93	30.041	88.0	2:30 P	53.0	4 A	70.5	70.3	64.7	7
3	29.93	29.74	29.796	89.0	3 P	63.0	12 P	76.0	71.6	67.3	6
4	29.91	29.65	29.743	80.0	1 P	56.0	12 P	68.0	68.1	61.2	5
5	30.18	29.91	30.070	72.5	3 P	48.0	12 P	60.3	61.1	53.3	10
6	30.24	30.05	30.132	73.0	4 P	40.0	4 A	56.5	59.3	53.3	12
7	30.05	29.60	29.739	70.0	5 P	54.5	5 A	62.3	64.6	62.8	2
8	29.76	29.36	29.546	72.0	2:30 P	53.0	12 P	62.5	62.7	57.8	3
9	29.94	29.76	29.905	72.0	5 P	44.5	5:30 A	58.3	58.5	51.0	15
10	29.94	29.70	29.768	74.0	12 M	47.0	5 A	60.5	60.0	56.3	3
11	29 93	29.77	29.862	71.0	3 P	47.5	5 A	59.3	58.7	53.3	8
12	29.85	29.71	29.765	82.5	2:30 P	52.5	5 A	67.5	65.8	59.2	3
13	30.00	29.77	29.843	77.0	4:30 P	55.0	6 A	66.0	69.5	64.3	3
14	30.05	29.86	30.030	81.0	3 P	62.5	12 P	71.7	71.5	65.5	8
15	30.01	29.67	29.798	73.0	5 P	60.0	5 A	66.5	66.8	65.7	0
16	29.67	29.44	29.529	83.0	3 P	64.0	12 P	73.5	72.1	71.0	1
17	29.82	29.43	29.601	70.0	4 P	57.0	12 P	63.5	63.7	56.2	9
18	29.96	29.82	29.918	79.0	5 P	50.5	4 A	64.7	65.7	57.3	15
19	29.91	29.72	29.784	70.0	6 P	51.0	4 A	60.5	61.0	60.2	1
20	29.87	29.78	29.845	78.0	3 P	50.0	4 A	64.0	64 6	57.7	9
21	29.88	29.79	29 835	58.0	12 M	52.0	4 A	55.0	55.4	55.3	0
22	29.92	29.85	29.851	72.0	4 P	51.0	6 A	61.5	61.2	54.0	12
23	29.96	29 91	29.935	69.0	1 P	45.0	5 A	57.0	57.3	50.8	6
24	29.96	29.88	29.933	71.0	6 P	44.5	5 A	57.7	58.5	52.0	4
25	29.94	29.63	29.825	77.0	5 P	45.0	5 A	61.0	63.2	56.0	9
26	29.63	29 24	29.382	71.0	4 P	57.0	3 A	64.0	63.1	56.2	7
27	29 75	29.53	29.649	66.0	4 P	52.0	5 A	59.0	60.5	53.5	3
28	29.91	29.75	29.880	76.0	4 P	54.5	5:30 A	65.3	66.5	57.5	3
29	29.92	29.79	29.846	63.0	10 A	49.5	5 A	56.3	56.7	56.2	2
30	29.93	29.84	29.908	72.0	2 P	50.0	5:30 A	61.0	62.7	57.0	5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	52.7	.677	63.3	W.S.W.	192	2.0	20	7 P				
2	60.7	.849	70.3	W.S.W.	160	1.0	14	10 P	9 P		T.	
3	64.3	.862	74.3	N.W.	189	12.5	50	5 P	3:30 P	12 P	.57	
4	56.3	.713	69.0	E.N.E.	207	5.5	33	1 P	0 A	10 P	.07	
5	42.3	.574	55.3	E.	142	2.0	20	3 P				
6	47.0	.551	67.3	W.	52	0.0	—	—				
7	61.0	.638	85.0	W.S.W.	182	1.5	17	4 P	12:30 P	8:30 P	.18	
8	54.0	.580	75.0	W.N.W.	157	7.5	39	11 P	12 M	1 P	.08	
9	43.3	.512	58.0	N.N.E.	173	1.5	17	11 A				
10	52.7	.548	75.3	W.	200	2.0	20	3 P	1:30 P	4 P	.02	
11	48.0	.517	68.7	W.	94	1.0	14	6 P				
12	53.7	.722	65.3	N.W.	143	6.5	36	1:30 P				
13	62.7	.676	87.3	S.	42	3.5	26	5 A	4 A	7 A	.35	
14	61.7	.789	72.3	S.	125	0.5	10	4 P				
15	64.7	.684	90.3	S.W.	59	0.0	—	—	5 A	7 A	.18	
16	70.3	.823	91.3	W.	104	6.0	35	1 P	12 M	10 P	1.59	
17	51.0	.566	67.0	N.N.E.	255	6.0	35	1 P				
18	50.3	.678	55.7	N.W.	176	1.5	17	12 M				
19	58.7	.562	88.3	N.	48	0.0	—	—	8 A	2 P	.02	
20	52.0	.631	66.3	N.N.E.	63	1.0	14	10 A				
21	51.7	.459	92.0	S.W.	69	2.0	20	1 P	6 A	9 P	.54	
22	49.3	.538	68.3	E.N.E.	80	1.0	14	3 P				
23	44.7	.480	64.3	N.	120	1.5	17	2 P	3:30 P		T.	
24	45.0	.518	59.7	N.	79	0.0	—	—	3 P	8:30 P	.02	
25	49.3	.622	62.0	N.W.	101	3.0	24	10 P				
26	49.3	.586	65.0	N.	285	15.0	55	2 P	2 A	7:30 A	.60	
27	48.0	.524	64.0	N.	295	6.5	36	12 M				
28	52.3	.669	55.0	N.	148	6.5	36	12 M				
29	54.7	.454	85.3	N.E.	44	2.0	20	1 P	8:30 A	7 P	.32	
30	51.7	.620	62.7	N.W.	108	0.5	10	7 P	5 P		T.	

*Rain or melted snowat base of tower. **Included in following day.

REMARKS.

More than the usual amount of gloomy and unseasonable weather was noted during June. Much cloudiness and rather low temperature were the most noticeable features, especially during the latter part of the month.

A comparison of the records with those of previous years shows the following interesting features: the mean barometer was about one-tenth of an inch lower than any previous June record, and lower than *any* of our monthly means excepting that for February, 1901. The range was unusually large and the fluctuations generally large and slow. The total wind movement was more than the normal and gales more frequent than usual at this time of year. The large amount of wind from the northwest quadrant during the last week was especially noticeable.

The mean temperature was three degrees below the normal, giving the coldest June on our records excepting only in 1897. The maximum temperature was low and the range small; the minimum was about normal. The mean dew point was about four degrees lower than usual and the relative humidity normal.

The total precipitation was about half an inch above the normal and well distributed throughout the month. The only large rainfall occurred on the 16th. The amount of cloudiness was fully ten per cent more than normal.

The hay crop is fair in this section. Corn and tobacco are backward on account of the cold weather. Apples and peaches are doing well and a good crop expected. The strawberry crop was light owing to unfavorable weather.

J. E. OSTRANDER, Meteorologist.

S. C. BACON, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 163. JULY, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.00, 7th, 12 M.
Minimum reduced to freezing,	29.33, 15th, 2 P.
Reduced† maximum reading,	30.29, 7th, 12 M.
Reduced† minimum reading,	29.61, 15th, 2 P.
Mean tri-daily reduced,	29.961
Monthly range,	.58

****Air Temperature.*** In Degrees Fahr.

Highest,	90.0, 14th, 3 P.
Lowest,	45.0, 17th, 5 A.
Mean hourly,	67.8
Mean of means of max. and min.,	68.3
Mean sensible (wet bulb),	63.2
Monthly range,	45.0
Highest mean daily,	79.0, 9th
Lowest mean daily,	60.6, 20th
Mean maximum,	77.9
Mean minimum,	58.8
Mean daily range,	19.1
Greatest daily range,	35.0, 12th
Least daily range,	5.0, 20th

Humidity.

Mean dew point,	57.3
Mean force of vapor,	.710
Mean relative humidity,	77.2

Precipitation. In inches.

Total precipitation,	4.66
Number of days on which .01 inch or more rain or melted snow fell,	13

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	2929m.
Greatest daily movement,	203m., 1st.
Least daily movement,	20m., 21st.
Mean daily movement,	94.5 m.
Mean hourly velocity,	3.9 m.
Maximum pressure per square foot,	7.5 lbs.= 39 m. per hour, 15th, 5 P., W.
Prevailing Direction,	West.

Summary.

South,	16 per cent.
West,	16 " "
North,	13 " "
West, Southwest,	13 " "
East, Northeast,	10 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	66 per cent.
Total cloudiness recorded by the Sun Thermometer,	277 hrs.=60 per cent.
Number of clear days,	4
Number of fair days,	11
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, . . . 185 hrs.=40%

Rain, 1st, 3d, 5th, 6th, 8th, 10th, 15th, 17th, 18th, 19th, 20th, 21st, 22d, 23d, 24th, 27th.

Thunder and Lightning, 14th, 15th, 17th, 20th, 21st, 22d, 24th, 28th.

Gales, 35 miles or more per hour, 39m., 15th, W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.00	29.74	29 850	75.0	6 P	56.0	5 A	65.5	63.4	58.5	8
2	30.15	30.00	30.135	81.0	5 P	51.0	5 A	66.0	66.7	59.7	12
3	30.11	29.66	29.843	71.5	3 P	59.0	5 A	65.3	63.1	60.5	3
4	29.95	29.83	29.934	84.0	6 P	56.5	3:30 A	70.3	71.2	63.3	15
5	29.93	29.83	29.850	79.0	4:30 P	63.0	6 A	71.0	69.3	63.8	9
6	30.21	29.89	30.076	77.0	3 P	64.5	6:30 A	70.7	67.0	62.7	10
7	30.29	30.12	30.206	72.5	4 P	64.5	6:30 A	68.5	64.5	61.2	11
8	30.12	29.95	30.004	88.0	5 P	64.0	4 A	76.0	74.6	71.0	10
9	29 99	29.76	29.866	89.0	3 P	67.0	6 A	78.0	79.0	71.2	11
10	30.00	29.72	29.830	81.0	4 P	63.5	9 A	72.3	70.5	64.7	8
11	30 07	30.00	30.056	79.5	5 P	48.0	5 A	63.7	65.2	58.0	15
12	30.08	29.93	29.998	81.5	3 P	46.5	5 A	64.0	66.8	60.2	5
13	30.01	29.94	29.981	85.0	5 P	54.0	5:30 A	69.5	71.6	63.8	12
14	30.01	29.91	29.945	90.0	3 P	60.0	5 A	75.0	75.5	68.8	10
15	29.93	29.61	29.725	85.5	3 P	60.0	8 P	72.7	70.7	67.2	3
16	29.95	29.74	29.819	72.0	6 P	56.5	6 A	64.3	64.0	58.0	7
17	29.98	29.73	29.837	75.0	4 P	45 0	5 A	60.0	61.1	58.3	3
18	30.06	29.76	29.975	78.0	11 A	62.5	2 A	70.3	70.0	62.8	2
19	30.10	29.92	30.040	64.5	5 P	58.5	6 A	61.5	61.3	60.2	0
20	29.92	29.80	29.837	64.0	4 P	59.0	5 A	61.5	60 6	59.5	0
21	29.81	29.74	29.767	67.0	5 P	57.0	6 A	62.0	61.9	60.8	0
22	29.92	29.76	29.825	81.0	2:30 P	60.0	4 A	70.5	67.6	64.5	4
23	30.11	29.92	30.044	83.5	5 P	61.5	6 A	72.5	70.1	65.5	6
24	30.13	30.07	30.110	76.0	2:30 P	63.5	5 A	69.7	67.4	64.3	2
25	30.16	30.12	30.155	69.5	1 P	60.5	8 A	65.0	63.7	60.2	0
26	30.17	30.10	30.147	69 5	4 P	57.5	6 A	63.5	62.5	59.5	2
27	30.11	29.95	30.030	67.0	4 P	57.0	2 A	62.0	63.5	62.7	0
28	29.95	29.88	29.908	82.0	6 P	60 0	0 A	71.0	73.0	69.2	3
29	29.96	29.89	29.925	81.5	1:30 P	64.5	6 A	73.0	72.0	68.0	2
30	30.06	29.96	30.014	80.0	4:30 P	64.0	12 P	72.0	71.8	66.5	3
31	30.09	29.98	30.043	84.5	3 P	58.0	6 A	71.3	72.3	65.2	9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	55.7	.431	79.3	N.	203	3.0	25	1 P	3 A	10:30 A	.12	
2	54.3	.707	65.0	N.N.E.	39	0.0	—	—				
3	59.0	.572	87.0	W.	154	4.0	28	11 A	8 A	11 A	.42	
4	58.3	.754	64.0	N.	34	0.0	—	—				
5	61.3	.748	75.7	S.	42	0.0	—	—	3 A	10 A	.19	
6	61.7	.703	81.3	S.	61	0.0	—	—	5 A	5 P	.34	
7	67.7	.642	76.3	W.S.W.	112	1.5	17	8 P				
8	69.3	.907	82.3	W.	167	0.5	10	1 A	6 A	7:30 A	.04	
9	67.0	1.037	69.3	N.W.	128	3.5	27	3 P				
10	60.3	.793	68.3	E.N.E.	123	1.5	17	9 P	6 A	10 A	.30	
11	52.0	.653	65.3	E.N.E.	57	0.0	—	—				
12	55.3	.719	66.3	W.	76	1.0	14	1 P				
13	59.3	.820	66.7	W.	73	0.5	10	4 P				
14	65.0	.953	68.7	W.N.W.	124	0.5	10	4 P				
15	65.3	.807	82.7	W.S.W.	167	7.5	39	5 P	2:30 P	8:30 P	.30	
16	52.0	.627	65.3	N.N.E.	142	2.0	20	5 P				
17	55.0	.591	76.7	W.	138	2.5	22	12 M	4:30 P		T.	
18	59.0	.708	71.3	N.N.W.	152	1.0	14	2 P	12 M		T.	
19	59.3	.541	94.0	S.	31	0.0	—	—	5 A	12 P	.61	
20	58.3	.530	93.7	E.S.E.	52	0.0	—	—	0 A	12 P	1.39	
21	59.3	.564	92.3	N.	20	0.0	—	—	6 A	6 P	.05	
22	62.0	.712	83.0	N.	28	0.0	—	—	5 A	10 P	.82	
23	62.7	.780	75.3	E.N.E.	57	0.5	10	10 A	4:30 A		T.	
24	62.0	.695	81.0	W.S.W.	160	1.0	14	5 P	2 P	2:30 P	.04	
25	57.7	.594	80.7	S.	94	0.0	—	—				
26	56.7	.587	79.7	S.	35	0.0	—	—				
27	61.7	.615	89.0	W.S.W.	138	0.5	10	7 P	1 P	4 P	.04	
28	67.3	.823	82.0	W.N.W.	97	0.5	10	4 P				
29	66.0	.801	82.0	S.E.	78	0.5	10	12 M				
30	63.7	.783	77.3	E.S.E.	69	0.5	10	12 M				
31	62.0	.834	71.0	S.W.	78	0.5	10	5 P				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

Without doubt the weather of July was disappointing to most people, and still it could hardly be characterized as disagreeable. While the number of clear days was small the amount of oppressive heat was correspondingly small. The large amount of cloudiness was the most noticeable feature of the month, though the mean temperature and relative humidity both showed a considerable departure from the normals.

A review of the several weather elements shows the following features of more or less interest: the mean barometric pressure was slightly below the normal and the range rather small. The total wind movement was about 85 per cent. of the normal and but a single gale occurred. During the last half of the month the steadiness of the barometer and small wind movement were quite marked.

The mean temperature was nearly two degrees lower than usual and the range small. The maximum for the month was the same as low maximums for July of 1895 and 1899. The minimum was about normal. The mean dew point was about 4 degrees below the normal and the relative humidity 5 per cent. above the normal.

The total precipitation was about .8 of an inch less than the normal. Nearly one-half the total fell during a single storm on the 19th-20th. While the precipitation was less than the normal it exceeded the July records of six of the preceeding ten years. The amount of cloudiness observed was greater than for any previous July since this station was established.

A fair hay crop has been harvested. That lately cut made considerable improvement during the month. Corn and tobacco are both very backward and poor yields are expected. Potatoes and onions promise a good crop. The outlook for the fall fruits is good.

J. E. OSTRANDER, Meteorologist.

S. C. BACON, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 164. AUGUST, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	28.97, 29th, 7 A.
Minimum reduced to freezing,	29.30, 6th, 12 P.
Reduced† maximum reading,	30.26, 29th, 7 A.
Reduced† minimum reading,	29.59, 6th, 12 P.
Mean tri-daily reduced,	29.920
Monthly range,	.67

****Air Temperature.*** In Degrees Fahr.

Highest,	87.0, 4th, 4 P.
Lowest,	43.0, 13th, 6 A.
Mean hourly,	66.1
Mean of means of max. and min.,	66.2
Mean sensible (wet bulb),	57.7
Monthly range,	44.0
Highest mean daily,	74.0, 2d
Lowest mean daily,	58.4, 18th
Mean maximum,	78.3
Mean minimum,	54.1
Mean daily range,	24.2
Greatest daily range,	35.5, 20th
Least daily range,	13.0, 6th

Humidity.

Mean dew point,	57.8
Mean force of vapor,	.662
Mean relative humidity,	76.3

Precipitation. In inches.

Total precipitation,	4.65
Number of days on which .01 inch or more rain or melted snow fell,	10

Wind.

Total movement,	2386m.
Greatest daily movement,	151m., 1st.
Least daily movement,	9m., 27th.
Mean daily movement,	77.0 m.
Mean hourly velocity,	3.2 m.
Maximum pressure per square foot, 8.0 lbs.= 40 m. per hour, 11th, 7 P., W.S.W.	
Prevailing Direction, North.	

Summary.

West, Southwest,	19 per cent.
East, Northeast,	16 " "
West,	13 " "
North,	10 " "
East,	10 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	220 hrs.=51 per cent.
Number of clear days,	7
Number of fair days,	14
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded, . . . 209 hrs.=49%

Rain, 1st, 4th, 6th, 8th, 10th, 11th, 18th, 19th, 21st, 22d, 23d, 25th, 27th, 29th.

Thunder and Lightning, 2d, 3d, 4th, 8th, 27th, 28th, 29th.

Gales, 35 miles or more per hour, 40m., 11th, W.S.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.03	29.92	29.970	80.5	3 P	64.5	6 A	72.5	72.5	65.8	4
2	29.96	29.85	29.921	84.5	5 P	63.0	5:30 A	73.7	74.0	66.6	6
3	29.93	29.79	29.867	82.5	1 P	62.0	6 A	72.3	71.0	68.2	3
4	29.87	29.76	29.817	87.0	4 P	63.0	6 A	75.0	73.0	67.3	5
5	29.94	29.85	29.880	82.5	4 P	61.0	6 A	71.7	71.4	65.5	6
6	29.85	29.59	29.667	76.0	4 P	63.0	12 M	69.5	68.0	65.2	2
7	29.79	29.59	29.699	74.0	2:30 P	57.5	6 A	65.7	66.0	59.0	7
8	29.87	29.62	29.734	76.5	2:30 P	57.0	6 A	66.7	65.5	59.7	5
9	30.12	29.87	30.006	80.0	5 P	50.0	6 A	65.0	66.3	60.7	8
10	30.15	30.02	30.090	82.0	2 P	52.0	6 A	67.0	67.5	62.7	7
11	30.02	29.72	29.853	82.0	4 P	61.0	6 A	71.5	67.8	65.2	3
12	30.08	29.85	29.977	74.0	4 P	52.5	6 A	63.3	63.6	56.2	7
13	30.11	30.02	30.077	76.0	5 P	43.0	6 A	59.5	61.1	54.7	14
14	30.09	29.97	30.020	80.0	4 P	45.0	6 A	62.5	62.8	56.7	10
15	29.98	29.77	29.858	79.0	3 P	47.5	6 A	63.3	63.0	58.8	6
16	29.85	29.77	29.822	73.0	5 P	49.5	6 A	61.3	61.4	54.3	7
17	29.85	29.76	29.812	73.5	5 P	44.0	6 A	58.7	60.4	54.5	11
18	29.85	29.78	29.824	68.0	1 P	44.0	6 A	56.0	58.4	58.2	2
19	29.88	29.79	29.843	67.0	7 P	50.5	12 P	58.7	58.8	56.8	2
20	29.97	29.88	29.943	79.5	5 P	44.0	6 A	61.7	62.8	57.8	12
21	29.96	29.81	29.878	71.0	1 P	55.5	6 A	63.3	64.4	61.5	2
22	29.83	29.71	29.790	76.0	11:30 A	57.5	6:30 A	66.7	64.8	60.0	5
23	29.96	29.77	29.856	76.0	1:30 P	51.0	6:30 A	63.5	62.5	57.5	5
24	30.03	29.95	29.994	74.5	2:30 P	49.5	6 A	62.0	62.5	58.3	6
25	30.01	29.88	29.942	80.0	3 P	55.5	6:30 A	67.7	66.6	59.2	11
26	29.94	29.86	29.905	82.5	4 P	50.5	6 A	66.5	67.7	61.7	8
27	30.03	29.91	29.971	82.5	1:30 P	53.5	6:30 A	68.0	67.0	63.0	6
28	30.24	30.03	30.171	78.5	2:30 P	57.0	6:30 A	67.7	66.6	59.7	4
29	30.26	30.16	30.211	81.0	4 P	55.0	6:30 A	68.0	67.6	62.5	13
30	30.20	30.07	30.125	83.0	3 P	55.0	6:30 A	69.0	70.2	64.7	11
31	30.09	29.94	30.005	85.0	4 P	62.5	6 A	73.7	73.0	68.2	11

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	63.0	.821	73.7	W.S.W.	151	1.0	14	4 P	11 A	12 M	T.	
2	63.0	.842	73.0	N.	74	0.5	10	3 P				
3	66.3	.789	85.3	W.S.W.	92	2.0	20	5 P				
4	65.3	.819	78.3	E.S.E.	54	1.0	14	3 P	6:30 P	8 P	.32	
5	61.7	.804	71.0	E.S.E.	110	0.0	—	--				
6	63.7	.685	86.7	S.	130	0.0	—	--	6 A	12 M	.62	
7	55.0	.628	72.3	N.	132	5.0	32	3 P				
8	56.0	.613	76.7	N.W.	137	2.5	22	2 P	3:30 A	6:30 A	24	
9	57.0	.669	73.7	W.	29	0.0	—	—				
10	58.7	.763	70.7	W.S.W.	42	0.0	—	—	6 P		T.	
11	63.0	.673	88.7	W.	80	8.0	40	7 P	2 A	8 P	2.77	
12	50.0	.612	62.7	N.E.	147	1.5	17	7:30 P				
13	48.0	.573	63.7	E.N.E.	81	0 5	10	12 M				
14	52.0	.612	73.3	W.	28	0.0	—	—				
15	54.7	.623	75.7	N.N.W.	84	5.5	33	4 P				
16	49.3	.547	69.0	E.N.E.	98	0.5	10	11 A				
17	58.7	.570	67.0	N.E.	78	0.5	10	2 P				
18	56.3	.539	86.0	E.	31	0.0	—	—	10 A		T.	
19	56.0	.484	93.3	E.N.E.	35	0 0	—	—	2 A	10:30 A	.31	
20	54.0	.623	76.3	W.	54	0.0	—	—				
21	56.0	.615	82.7	W.S.W.	99	1.0	14	3 P	8:30 A	3:30 P	.04	
22	58.0	.593	82.3	S.	32	0.5	10	5 P	11 A	9 P	.26	
23	56.3	.565	78.0	E.N.E.	97	1.5	17	12 M	1 A	3:30 A	.03	
24	54.7	.611	76.3	E.	101	4.0	28	2 P				
25	54.3	.682	69.3	E.N.E.	116	4.0	28	2 P	3 P	5:30 P	.02	
26	57.3	.727	73.3	N.W.	42	0.5	10	3 P				
27	61.3	.663	86.7	N.	9	0.0	—	—	1:30 P	3 P	.04	
28	55.3	.672	69.3	E.	94	0.0	—	—				
29	59.7	.705	74.0	S.E.	15	0.0	—	—	5:30 P	6 P	T.	
30	61.0	.541	76.3	W.S.W.	44	0.0	—	—				
31	66.0	.846	80.7	W.S.W.	70	0.0	—	—				

*Rain or melted snow at base of tower. **Included in following day.

REMARKS.

The low temperature which prevailed during June and July was continued through August, making the coolest summer season on our records. The weather during the month was generally pleasant and but very few sultry days occurred. The many cool nights and absence of storms contributed much to personal comfort in this section.

A comparison of the records for the month with those of previous years shows the following features of interest: the mean barometer made a new low record for August here and was over .07 in. below the normal. The range was nearly normal. The pressure was rather unsteady throughout the month. The total wind movement was hardly 80 per cent. of the normal and the greatest daily movement rather small. But one light gale occurred. In direction the wind was nearly equally divided between the northeast and southwest quadrants.

The mean temperature was over 2 degrees below the normal, and lower than any previous August record at this station. The maximum was nearly 5 degrees lower than usual and the mimimum normal giving a small range for the month. The mean dew point was about 4 degrees below the normal while the relative humidity was slightly high.

The total precipitation was .6 in. more than usual and almost exactly the same as for July. Six-tenths of the whole amount fell during a single storm on the 11th. During the last 20 days the precipitation was very light. The amount of sunshine was normal.

A large crop of potatoes is reported. Many however are affected with rot. The tobacco crop is good with an unusually large percentage of perfect leaves. Corn is very poor except on some low ground. The apple crop will be good in this section.

J. E. OSTRANDER, Meteorologist.

S. C. BACON, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 165. SEPTEMBER, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.08, 6th, 8 A.
Minimum reduced to freezing,	29.31, 9th, 8 P.
Reduced† maximum reading,	30.38, 6th, 8 A.
Reduced† minimum reading,	29.60, 9th, 8 P.
Mean tri-daily reduced,	30.043
Monthly range,	.78

****Air Temperature.*** In Degrees Fahr.

Highest,	86.5, 1st, 3 P.
Lowest,	35.0, 6th, 6 A.
Mean hourly,	60.3
Mean of means of max. and min.,	60.9
Mean sensible (wet bulb),	57.1
Monthly range,	51.5
Highest mean daily,	76.8, 1st
Lowest mean daily,	30.0, 25th
Mean maximum,	71.6
Mean minimum,	50.1
Mean daily range,	21.5
Greatest daily range,	35.0, 6th, 11th, 16th
Least daily range,	6.5, 26th

Humidity.

Mean dew point,	53.7
Mean force of vapor,	.571
Mean relative humidity,	79.1

Precipitation. In inches.

Total precipitation,	5.83
Number of days on which .01 inch or more rain or melted snow fell,	14

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	2680m.
Greatest daily movement,	229m., 9th.
Least daily movement,	9m., 28th.
Mean daily movement,	89.3 m.
Mean hourly velocity,	3.7 m
Maximum pressure per square foot, 4.0 lbs.= 28 m. per hour, 9th, 9 P., N.E.	
Prevailing Direction, North, Northwest.	

Summary.

North, Northeast,	17 per cent.
East, Northeast,	10 " "
West. Southwest,	13 " "
West,	13 " "
Northwest,	13 " "
North, Northwest,	13 " "
Other directions,	21 " "

Weather.

Mean cloudiness observed,	57 per cent.
Total cloudiness recorded by the Sun Thermometer,	224 hrs.=60 per cent.
Number of clear days,	6
Number of fair days,	8
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, . . . 149 hrs.=40%

Rain, 1st, 4th, 7th, 9th, 10th, 13th, 18th, 19th, 20th, 25th, 26th, 27th, 28th, 29th, 30th.

Thunder and Lightning, 4th, 16h.

Frost, 6th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.96	29.83	29.887	86.5	3 P	67.0	6 A	76.7	76.8	70.7	9
2	30.03	29.85	29.911	83.0	3 P	53.0	12 P	68.0	69.8	62.8	5
3	30.08	29.93	30.009	78.5	3 P	46.0	5:30 A	62.3	64.1	58.2	13
4	29.93	29.69	29.773	77.0	1 P	55.0	12 P	66.0	65.0	62.3	1
5	30.29	29.82	30.114	67.0	4 P	43.0	12 P	55.0	56.6	48.8	12
6	30.38	30.25	30.317	70.0	3 P	35.0	6 A	52.5	54.4	49.3	6
7	30.25	29.99	30.061	76.0	4 P	57.5	7 A	66.7	63.1	62.2	3
8	30.10	30.02	30.058	81.0	3 P	48.5	6 A	64.7	65.6	58.2	12
9	30.02	29.60	29.807	78.0	11 A	55.0	2 A	66.5	65.0	61.0	2
10	30.02	29.68	29.897	70.0	2:30 P	47.0	12 P	58.5	59.3	52.8	7
11	30 17	30.02	30.118	75.0	4 P	40.0	5 A	57.5	58.4	54.3	12
12	30.22	30.10	30.153	76.0	2:30 P	46.5	5:30 A	61.3	60.7	56.8	8
13	30.10	29.91	29.986	70.5	3 P	50.0	12 P	60.3	59.5	59.3	0
14	30.15	29.94	30.124	70.0	3 P	45.5	5:30 A	57.7	55.1	50.7	8
15	30.21	30.10	30.173	69.0	4 P	37.0	5 A	53.0	52.0	47.7	12
16	30.30	30.18	30.256	72.0	3 P	37.0	12 P	54.5	53.9	50.0	9
17	30.33	30.28	30.318	73.0	3 P	42.0	5:30 A	57.5	55.4	51.0	10
18	30.30	30.18	30.242	61.5	2:30 P	42.5	2 A	52.0	54.4	55.2	0
19	30.21	30.15	30.184	65.0	3 P	55.0	5 A	60.0	59.8	60.0	0
20	30.31	30.19	30.272	70.5	3 P	59.5	12 P	65.0	63.3	62.3	0
21	30.32	30.20	30.271	70.0	2:30 P	56.0	6 A	63.0	60.6	58.5	4
22	30.20	30.00	30.080	74.5	4 P	57.5	6 A	66.0	63.0	60.8	6
23	30.00	29.85	29.901	80.0	3 P	53.0	3 P	66.5	64.4	60.2	9
24	30.16	29.85	30.031	64.5	3 P	46.0	12 P	55.3	54.0	53.0	0
25	30.25	30.16	30.237	57.0	3 P	43.5	3 A	50.3	50.0	46.8	0
26	30.22	30 02	30.130	55.5	3 P	49.0	6 A	52.3	51.3	51.2	0
27	30.02	29.77	29.793	63.0	4 P	53.0	5 A	58.0	58.1	58.7	0
28	29.77	29.64	29.720	70.5	4 P	60.0	4 A	65.3	64.3	63.8	0
29	29.78	29.62	29.720	72.0	3 P	62.0	6:30 A	67.0	65.3	62.5	1
30	29.78	29.69	29.741	72.5	11:30 A	61.0	12 P	66.7	64.6	62.8	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	67.3	.958	73.3	W.S.W.	185	1.5	17	3 P	9:30 P	10 P	.02	
2	58.3	.758	70.0	N.E.	121	0.5	10	4 P				
3	53.0	.669	68.7	W.	69	0.0	—	—				
4	61.3	.614	89.3	N.W.	158	3.0	24	1 P	6 A	3 P	.16	
5	40.7	.473	57.7	N.N.E.	122	1.0	14	8 A				
6	44.7	.474	70.7	S.W.	86	1.0	14	6 P				
7	60.3	.616	88.3	W.S.W.	92	0.5	10	3 P	7 A	1:30 P	.20	
8	52.7	.676	67.0	W.	85	0.0	—	—				
9	59.0	.624	82.3	W.S.W.	229	4.0	28	9 P	2 P	12 P	1.30	
10	48.0	.501	71.0	N.N.E.	139	1.0	14	11 A	0 A	6 A	.02	
11	50.7	.555	75.7	W.	54	0.0	—	—				
12	51.7	.579	77.0	W.S.W.	127	1.5	17	5 P				
13	57.3	.554	90.0	S.E.	152	1.0	14	5 P	7 A	9 P	.61	
14	46.0	.433	73.7	N.W.	71	0.5	10	10:30 P				
15	43.3	.420	76.0	N.N.W.	40	0.5	10	1 P				
16	45.0	.479	74.3	W.N.W.	21	0.0	—	—				
17	46.7	.495	73.0	N.N.E.	64	0.0	—	—				
18	53.3	.472	88.7	N.N.W.	88	0.0	—	—	11:30A	12 P	.28	
19	59.0	.542	94.7	N.N.W.	104	0.0	—	—	0 A	12 P	1.45	
20	60.3	.613	88.7	N.E.	59	0.0	—	—	0 A	7:30 A	.35	
21	56.3	.565	82.7	E.N.E.	49	0.0	—	—				
22	58.7	.618	74.7	E.N.E.	26	0.5	10	3 P				
23	55.7	.691	73.0	S.E.	32	0.0	—	—				
24	48.0	.494	70.0	N.N.W.	141	0.0	—	—				
25	41.7	.386	71.0	E.N.E.	60	2.5	22	10 A	8 A	10:30A	.01	
26	49.3	.391	94.0	W.	20	0.0	—	—	0 A	12 P	.69	
27	58.0	.530	96.3	N.W.	86	0.0	—	—	0 A	10 P	.26	
28	62.7	.663	91.7	N.W.	9	0.0	—	—	5 A	12 P	.28	
29	61.0	.652	85.3	N.N.E.	101	0.5	10	11 A	0 A	4:30 P	.20	
30	61.0	.638	85.0	N.N.E.	90	0.0	—	--	10:30A		T.	

*Rain or melted snowat base of tower. **Included in following day.

REMARKS.

The weather for the month was less pleasant than usual at this time of the year, owing to the large amount of cloudiness and numerous rains. These disagreeable features were especially prominent the latter part of the month; there being but 20 hours of sunshine recorded after the 17th, and the precipitation for the same period exceeding $3\frac{1}{2}$ inches. A light frost was noted on one date early in the month and reported on other dates also from places in this vicinity. Little if any damage resulted from them.

Comparing the records with the normals at this station shows the following characteristics: the mean barometer was nearly normal and the range small. The total wind movement was about four-fifths the normal and no gales occurred.

The mean temperature was slightly below the normal, the range less than usual and the minimum for the month rather high. The relative humidity was about three per cent. above the normal.

The total precipitation was more than 40 per cent. above the usual amount, several rather heavy rains being noted. Fifteen days of the month have a record for precipitation.

Corn has made progress during the month but much of it will probably not mature and the crop will be poor. Tobacco harvested early is in good condition but that harvested later has suffered some from pole sweat. The rowen crop is late and unsatisfactory. Apples are an average crop in this locality.

J. E. OSTRANDER, Meteorologist.

S. C. BACON, Observer.

Erratum: Bulletin No. 164—

Max. Barometer reduced to freezing should read 29.97 instead of 28.97.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 166. OCTOBER, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.21, 26th, 7 A.
Minimum reduced to freezing,	28.97, 28th, 3 P.
Reduced† maximum reading,	30.52, 26th, 7 A.
Reduced† minimum reading,	29.27, 28th, 3 P.
Mean tri-daily reduced,	30.028
Monthly range,	1.25

****Air Temperature.*** In Degrees Fahr.

Highest,	74.0, 19th, 3 P.
Lowest,	22.5, 22d, 6 A.
Mean hourly,	50.7
Mean of means of max. and min.,	50.3
Mean sensible (wet bulb),	46.2
Monthly range,	51.5
Highest mean daily,	63.6, 19th
Lowest mean daily,	39.2, 22d
Mean maximum,	61.0
Mean minimum,	39.6
Mean daily range,	21.4
Greatest daily range,	32.5, 22d
Least daily range,	4.5, 1st

Humidity.

Mean dew point,	40.5
Mean force of vapor,	.396
Mean relative humidity,	70.9

Precipitation. In inches.

Total precipitation,	5.59
Number of days on which .01 inch or more rain or melted snow fell,	11
Snow, total in inches,	trace

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4398m.
Greatest daily movement,	312m., 25th.
Least daily movement,	6m., 18th.
Mean daily movement,	142 m.
Mean hourly velocity,	5.9 m.
Maximum pressure per square foot, 8.0 lbs.= 40 m. per hour, 29th, 5 P., W.N.W.	
Prevailing Direction, West, Southwest.	

Summary.

South, Southeast,	19 per cent
North, Northwest,	13 " "
West,	16 " "
West, Southwest,	10 " "
Other directions,	42 " "

Weather.

Mean cloudiness observed,	51 per cent.
Total cloudiness recorded by the Sun Thermometer,	177 hrs.=52 per cent.
Number of clear days,	7
Number of fair days,	10
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded, . . . 164 hrs.=48%

Rain, 1st, 4th, 5th, 11th, 12th, 18th, 19th, 20th, 22d, 23d, 24th, 27th, 28th, 30th.

Snow, 29th.

Thunder and Lightning, 19th, 20th, 24th.

Killing Frost, 10th.

Heavy Frosts, 15th, 17th, 21st, 22d, 24th, 26th, 30th.

Gales, 35 miles or more per hour, 35 m. 13th. S.S.E.; 40 m. 29th, W.N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.80	29.63	29.683	64.5	5 P	60.0	6 A	62.3	61.6	60.2	0
2	30.02	29.80	29.957	72.5	3 P	54.0	5:30 A	63.3	62.5	59.3	2
3	30.08	29.97	30.023	73.0	4:30 P	54.0	6 A	63.5	61.1	53.7	6
4	30.06	29.99	30.031	66.5	4 P	50.0	6 A	58.3	56.8	49.5	4
5	30.02	29.67	29.885	55.5	12 M	48.5	6 A	52.0	52.8	52.2	0
6	29.73	29.52	29.589	73.5	2:30 P	52.0	12 P	62.7	61.5	54.3	5
7	29.83	29.73	29.817	71.0	3 P	42.0	5 A	56.5	57.7	50.7	11
8	30.06	29.80	29.988	60.0	3 P	45.0	8:30 P	52.5	52.3	45.7	11
9	30 32	29.98	30.095	67 0	1 P	37.0	12 P	52.0	53.0	45.7	9
10	30.40	30.20	30.299	60.0	3 P	28.5	6 A	44.3	44.1	38.5	11
11	30 29	29.70	29.957	59.0	4 P	35.0	6 A	47.0	48.9	49.7	0
12	29.86	29.48	29.978	65.5	4 P	47.0	12 P	56.3	55.9	53.7	3
13	29.96	29.70	29.837	71.0	3 P	42.0	5 A	56.5	56.6	55.0	4
14	29.96	29.67	29.830	63 0	3 P	41.0	12 P	52.0	55.9	45.5	6
15	30.04	29.86	29.954	59.0	3 P	30.5	6 A	44.7	46.3	41.0	11
16	30.16	29.91	29.988	63.5	1 P	40.0	6 A	51.7	49.9	43.3	7
17	30.31	30.16	30.280	53 0	5 P	30.0	12 P	41.5	40.7	35.2	10
18	30.34	30.09	30.237	56.0	12 P	30.0	0 A	43.0	41.2	41.2	0
19	30.09	29.89	29.996	74.0	3 P	56.0	0 A	65.0	63.6	60.3	7
20	30.07	29.88	29.988	62.0	2:30 P	45.0	12 P	53.5	55 2	44.2	10
21	30.36	30.07	30.256	48.5	4 P	29.0	12 P	38.7	40.3	33.8	6
22	30.41	30.08	30.262	55.0	4 P	22.5	6 A	38.7	39.2	36.7	8
23	30.36	30.02	30.176	55 0	4:30 P	36 0	12 P	45.5	46 5	43.2	3
24	30.39	29.94	30.190	56.0	12 P	25.5	6:30 A	40.7	42.5	42.6	1
25	30.41	29.89	30.158	61.0	12 M	38.0	12 P	49 5	52.3	44.0	6
26	30.52	30 24	30.408	50.5	3 P	28.0	6:30 A	39.3	40.8	36.2	6
27	30.24	29.79	29.942	65 0	3 P	43.0	6:30 A	54 0	53.8	53.8	0
28	29.79	29.27	29.407	62.0	7 A	43 0	12 P	52 5	53.6	52.0	1
29	30.22	29.53	29.939	44.0	3 P	36.0	12 P	40 0	40.0	34.3	3
30	30.44	30.22	30.388	51.5	2 P	27.0	6 A	39 3	40.8	36.8	9
31	30.42	30.26	30.335	54.0	3 P	33.0	12 P	43 5	43.5	39.3	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Snow.
1	59.3	.549	91.7	N.	54	0.0	—	—	4:30 A	3:30 P	.38	
2	56.7	.569	84.0	N.N.W.	59	0.0	—	—				
3	48.7	.530	69.3	N.N.W.	48	0.0	—	—				
4	42.3	.461	65.3	N.N.W.	61	4.0	28	4 P	10:30 A	12 P	.44	
5	51.7	.397	97.0	N.	23	0.0	—	—	0 A	7:30 A	.16	
6	48.3	.555	67.0	W.S.W.	144	5.5	33	9 P				
7	45.3	.496	67.3	S.S.E.	115	1.0	14	1 P				
8	39.0	.395	62.7	W.S.W.	168	4.0	28	11 A				
9	36.0	.436	56.3	W.	207	3.0	24	12 M				
10	28.0	.324	62.0	S.W.	66	0.0	—	—				
11	48.3	.393	90.3	S.E.	96	0.5	10	3 P	6 P	12 P	.53	
12	50.7	.477	79.0	N.N.W.	189	3.0	24	11 A	0 A	7 A	.52	
13	52.0	.336	78.7	S.S.E.	137	6.0	35	3 P				
14	36.7	.422	55.7	W.S.W.	230	2.5	22	2 P				
15	34.0	.336	64.0	S.E.	121	3.5	26	1:30 P				
16	36.3	.363	64.0	S.	182	2.0	20	1:30 P				
17	27.7	.260	67.0	W.N.W.	86	1.0	14	2 P				
18	40.0	.269	93.3	S.S.W.	6	0.5	10	2 P	6 A	9 P	.04	
19	57.3	.628	78.0	S.S.E.	224	3.0	24	6 P	10 P	12 P	T.	
20	31.0	.422	45.3	W.	211	3.0	24	2 P	0 A	2 A	.27	
21	26.0	.238	63.0	N.N.W.	148	4.0	28	1 P				
22	29.0	.289	64.7	S.S.E.	132	1.5	17	4:30 P	9 P		T.	
23	38.0	.332	70.7	W.	182	2.0	20	2 P	6 A	7:30 A	.09	
24	38.7	.321	82.7	S.S.E.	91	3.5	26	6 P	6 P	9 P	.05	
25	34.0	.400	48.3	W.	312	4.0	28	6 A				
26	29.7	.263	67.0	S.S.E.	173	0.5	10	6 P				
27	52.0	.478	84.3	S.	142	1.5	17	6 P	5 A	12 P	.08	
28	49.0	.440	82.0	N.W.	220	5.0	33	2 P	0 A	12 M	3.03	
29	27.0	.240	62.0	N.W.	231	8.0	40	5 P	1 P			T.
30	29.0	.281	64.7	S.S.W.	139	3.5	26	6 P	5 P		T.	
31	34.0	.389	72.0	W.	201	3.0	24	1 P				

*Rain or melted snowat base of tower. **Included in following day.

REMARKS.

The weather during the month was generally pleasant, and the various weather elements more nearly normal than for some months past. The first killing frost of the season was noted on the 10th, and heavy frosts were frequent after that date. Thin ice was formed on the 22d and 30th, and a trace of snow noted on the 29th. Although the mean temperature was but slightly above the normal, during the daytime the month seemed milder than usual.

The mean barometer was nearly normal and the range was unusually large. The fluctuations of pressure were larger than usual especially during the last week. On the 26th at 7 A. M. the maximum of the month was noted. A rather steady fall followed until 3 P. M. on the 28th, when the minimum was reached. The rise was even more rapid than the fall and by 9 A. M. on the 30th the recovery was nearly complete. During the latter part of the fall an unusually heavy rainfall occurred giving over three inches precipitation in twelve hours. The total wind movement was about twenty per cent. more than usual, the last week being especially windy.

While the mean temperature was nearly normal the mean dew point and relative humidity were both rather low.

The total precipitation was nearly fifty per cent. more than normal owing to the heavy storm referred to above. The amount of cloudiness was nearly normal.

J. E. OSTRANDER, Meteorologist.

S. C. BACON, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 167. NOVEMBER, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.17, 1st, 7 A.
Minimum reduced to freezing,	29.07, 22d, 6 P.
Reduced† maximum reading,	30.48, 1st, 7 A.
Reduced† minimum reading,	29.36, 22d, 6 P.
Mean tri-daily reduced,	30.055
Monthly range,	1.12

****Air Temperature.*** In Degrees Fahr.

Highest,	65.0, 4th, 4 P.
Lowest,	17.5, 29th, 7 A.
Mean hourly,	42.0
Mean of means of max. and min.,	42.4
Mean sensible (wet bulb),	39.2
Monthly range,	47.5
Highest mean daily,	55.0, 6th
Lowest mean daily,	31.0, 29th
Mean maximum,	52.7
Mean minimum,	32.1
Mean daily range,	20.6
Greatest daily range,	39.0, 10th
Least daily range,	3.0, 27th

Humidity.

Mean dew point,	34.2
Mean force of vapor,	.291
Mean relative humidity,	75.6

Precipitation. In inches.

Total precipitation,	1.27
Number of days on which .01 inch or more rain or melted snow fell,	8
Snow, total in inches,	1.5
Snow on ground at end of month,	1.5

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3077m.
Greatest daily movement,	250m., 23d.
Least daily movement,	12m., 20th.
Mean daily movement,	102 m.
Mean hourly velocity,	4.3 m.
Maximum pressure per square foot, 9.5 lbs.= 44 m. per hour, 22d, 7 P., W.N.W.	
Prevailing Direction, West.	

Summary.

North,	10 per cent.
South, Southwest,	10 " "
North, Northwest,	13 " "
Northwest,	10 " "
South, Southeast,	17 " "
South,	13 " "
Other directions,	27 " "

Weather.

Mean cloudiness observed,	62 per cent.
Total cloudiness recorded by the Sun Thermometer,	184 hrs.=63 per cent.
Number of clear days,	4
Number of fair days,	11
Number of cloudy days,	15

Bright Sunshine.

Number of hours recorded, . . . 109 hrs.=37%

Rain, 6th, 11th, 12th, 13th, 19th, 22d, 24th, 26th, 27th.

Snow, 23d, 26th, 30th.

Gales, 35 miles or more per hour, 44 m. 22d, W.N.W.; 43 m. 23d, W.N.W.; 41m.28th, W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.48	30.36	30.432	56.0	4 P	27.0	6:30 A	41.5	38.7	35.3	10
2	30.39	30.19	30.304	61.5	3 P	24.5	6:30 A	43.0	40.9	39.3	9
3	30.20	30.03	30.121	60.0	4 P	32.5	4 A	46.3	45.2	45.3	6
4	30.22	30.12	30.182	65.0	4 P	34.0	6:30 A	49.5	46.7	41.3	8
5	30.23	30.10	30.172	53.5	3 P	31.0	3:30 A	42.3	43.0	44.3	4
6	30.10	29.88	29.979	59.5	4:30 P	49.0	6 A	54.3	55.0	54.3	0
7	30.23	29.92	30.077	56.0	3 P	35.0	12 P	45.5	47.8	40.5	6
8	30.33	30.23	30.286	49.0	3 P	25.0	6:30 A	37.0	36.4	32.8	7
9	30.27	29.99	30.134	49.5	3 P	27.0	6 A	38.3	37.2	33.5	5
10	30.19	29.87	29.988	64.0	1:30 P	25.0	6 A	44.5	41.7	38.2	7
11	30 35	30.19	30.315	46.0	3 P	25.5	6 A	35.7	37.4	32.2	5
12	30.26	29.85	29.967	61.0	12 P	37.5	3 A	49.3	52.0	51.2	1
13	30.36	29.98	30.321	61.0	0 A	34.0	8 P	47.5	41.3	35.2	0
14	30.25	30.08	30.138	60.0	3:30 P	34.5	0 A	47.3	45.7	45.5	3
15	30.08	29.91	29.993	62.5	5 P	39.0	1 A	50.7	51.7	51.3	2
16	30.23	30.04	30.143	61.5	3 P	40.0	12 P	51.3	50.3	43.0	9
17	30.30	30.22	30.282	44.5	3 P	36 0	2 A	40.3	41.1	40.0	0
18	30.30	30.17	30.250	45.0	2 P	39.0	6:30 A	42.0	41.8	40.0	0
19	30.18	30.10	30.142	53.0	4 P	32.0	12 P	42.5	42.7	41.5	2
20	30.29	30.11	30.214	56.0	3 P	27.0	8 A	41.5	37.7	36.8	4
21	30.11	29.86	29.942	58.0	4 P	26.5	4 A	42.3	42.9	42.8	2
22	29.86	29.36	29 562	63.0	3 P	43.5	6:30 A	53.3	51.4	45.8	3
23	29.85	29.46	29.717	39.0	10 A	34.0	12 P	36.5	37.4	30.5	4
24	29 77	29.53	29.589	51.0	2 P	27.0	3 A	39.0	43.2	40.8	0
25	29.90	29.59	29.801	47.0	3 P	37.5	8:30 A	42.3	42.1	37.7	0
26	29.88	29 58	29.663	41.0	4 A	31.0	1 P	36.0	34.3	32.3	0
27	29.63	29.48	29.584	35.0	9 P	32.0	6 A	33.5	33.2	33.3	0
28	30.25	29.48	29.854	34.0	5 A	27.0	12 P	30.5	31.4	28.0	2
29	30.47	30.27	30.382	42.5	3 P	17.5	7 A	30.0	31.0	28.3	6
30	30.27	29 98	30.113	45.0	1 P	32.0	12 P	38.5	39.3	34.7	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.*	Total in Inches. Snow.
1	29.3	.292	71.7	N.W.	30	0.0	—	—				
2	34.3	.324	73.7	S.S.W.	59	0.0	—	—				
3	41.7	.363	78.7	S.S.E.	40	0.0	—	—				
4	36.0	.340	73.0	W.N.W.	59	0.0	—	—				
5	42.7	.317	90.0	S.	41	0.0	—	—				
6	53.3	.443	93.7	S.S.E.	167	1.5	17	10 P	9:30 A	10 P	.05	
7	33.3	.319	64.3	W.N.W.	153	1.5	17	4 P				
8	26.3	.229	71.7	N.	107	0.0	—	—				
9	25.3	.240	63.7	N.N.W.	165	1.0	14	1:30 P				
10	31.3	.304	67.7	N.N.W.	108	2.5	22	4 P				
11	22.0	.232	57.7	N.E.	60	0.5	10	0 A	6:30 P	12 P	T.	
12	48.7	.429	83.0	S.S.E.	186	1.5	17	1 P	0 A	12 M	.16	
13	32.0	.219	84.0	N.E.	81	0.5	10	5 A	7 A	10 P	.03	
14	43.0	.347	85.7	S.S.E.	37	0.0	—	—				
15	49.7	.415	90.0	S.S.E.	102	0.0	—	—				
16	36.7	.356	65.7	N.W.	85	0.0	—	—				
17	36.7	.267	83.3	N.	82	0.0	—	—				
18	37.3	.268	83.0	N.N.E.	75	0.0	—	—				
19	39.3	.289	85.3	N.N.W.	85	0.0	—	—	6 A	8 A	.07	
20	32.3	.269	77.7	S.	12	0.0	—	—				
21	39.7	.334	80.3	S.	15	0.0	—	—				
22	39.7	.390	64.7	S.S.W.	140	9.5	44	7 P	6:30 P	9 P	.05	
23	17.7	.214	48.3	W.S.W.	250	9.0	43	1:30 P	10:30 \	11:30 \		T.
24	32.7	.320	62.3	S.	190	5.5	33	8 A	8:30A		T.	
25	32.3	.263	72.0	W.S.W.	94	0.0	—	—				
26	30.3	.189	90.3	N.N.W.	217	1.5	17	4 A	4 A	12 P	.59	T.
27	31.7	.160	95.0	N.	62	0.0	—	—	0 A	4:30 P	.17	
28	22.3	.172	71.0	N.W.	192	8.5	41	7 A	9 P			
29	20.7	.195	67.0	E.	57	1.0	14	7 P				
30	29.0	.232	74.0	S.S.W.	126	2.5	22	1 P	7:30 P	11 P	.15	1.5

*Rain or melted snowat base of tower. **Included in following day.

REMARKS.

The weather for November proved to be more pleasant than usual, although the departures from the normals of several of the weather elements were unusually large. The large number of mild days, high percentage of cloudiness and light precipitation were the more noticeable characteristics.

Comparing the records with those of previous years the following features of interest are noted : the mean barometer was normal and the range unusually small. The fluctuations were generally small excepting during a few days the latter part of the month. The total wind movement was about two-thirds the normal. But few gales were noted and those were light. The Force of Wind chart showed no pressure on more than half the days of the month.

The mean temperature was four and one-half degrees above the normal, and higher than any previous record for the month at this station. The maximum temperature was nearly normal but the minimum was seven degrees above the mean November minimum. Owing to the high minimum the range was much less than usual. The mean dew point was unusually high and the relative humidity about normal.

The total precipitation was about one-third the usual amount and nearly all of it fell near the end of the month. The total number of hours of sunshine was very small, the last third of the month being especially cloudy. Thin ice formed on the morning of the 29th and a light snowfall occurred on the evening of the 30th.

J. E. OSTRANDER, Meteorologist.

S. C. BACON, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 168. DECEMBER, 1902.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.42, 15th, 10 A.
Minimum reduced to freezing,	29.09, 5th, 11 P.
Reduced† maximum reading,	30.75, 15th, 10 A.
Reduced† minimum reading,	29.41, 5th, 11 P.
Mean tri-daily reduced,	30.058
Monthly range,	1.34

****Air Temperature.*** In Degrees Fahr.

Highest,	49.0, 16th, 6 P.
Lowest,	—15.0, 10th, 1 A.
Mean hourly,	23.5
Mean of means of max. and min.,	23.7
Mean sensible (wet bulb),	21.3
Monthly range,	64.0
Highest mean daily,	41.1, 22d
Lowest mean daily,	—6.0, 9th
Mean maximum,	33.6
Mean minimum,	13.9
Mean daily range,	19.7
Greatest daily range,	54.0, 10th
Least daily range,	6.0, 13th

Humidity.

Mean dew point,	15.0
Mean force of vapor,	.145
Mean relative humidity,	72.5

Precipitation. In inches.

Total precipitation,	4.27
Number of days on which .01 inch or more rain or melted snow fell,	17
Snow, total in inches,	26.5
Snow on ground at end of month,	6.0

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4018m.
Greatest daily movement,	340m., 5th.
Least daily movement,	3m., 7th.
Mean daily movement,	129.6 m.
Mean hourly velocity,	5.4 m.
Maximum pressure per square foot, 12.5 lbs.= 50 m. per hour, 8th, 12 M., W.S.W.	
Prevailing Direction, West, Nowthwest.	

Summary.

North, Northwest,	26 per cent.
Northwest,	13 " "
West, Northwest,	10 " "
West,	10 " "
South,	10 " "
Other directions,	31 " "

Weather.

Mean cloudiness observed,	60 per cent.
Total cloudiness recorded by the Sun Thermometer, 164 hrs.=58 per cent	
Number of clear days,	9
Number of fair days,	6
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, 119 hrs.=42%

Rain, 3d, 15th, 21st, 22d, 29th, 30th.

Snow, 5th, 7th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 18th, 21st, 22d, 25th, 26th, 27th, 29th, 30th.

Gales, 35 miles or more per hour, 48 m. 5th, N.N.W.; 50 m. 8th W.S.W.; 38m. 16th, S. S.E.; 44 m. 18th, W.S.W.

Number of days sleighing, 27

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.98	29.85	29.908	40.5	2:30 P	23.5	6:30 A	32.0	31.4	29.0	5
2	29.93	29.83	29.891	44.5	3 P	25.0	6 A	34.7	33.5	31.5	5
3	29.83	29.53	29.584	45.0	12 P	32.0	3 A	38.5	37.1	37.5	0
4	29.92	29.64	29.876	45.0	12 M	33.0	12 P	39.0	37.2	31.8	3
5	30.00	29.41	29.657	33.0	0 A	13.0	12 P	23.0	22.7	18.8	0
6	30.38	30.00	30.285	26.0	1 P	2.0	6:30 A	14.0	12.3	8.5	9
7	30.40	29.85	30.063	18.0	4 P	−2.0	3 A	8.0	9.1	9.5	0
8	30.14	29.80	29.947	28.0	1 P	3.0	12 P	15.5	14.0	8.5	6
9	30.43	30.14	30.379	2.0	3 P	−14.5	7 A	−6.3	−6.0	−9.2	9
10	30.42	29.87	30.053	39.0	12 P	−15.0	1 A	12.0	14.7	18.0	0
11	30.22	29.93	30.167	40.0	1 A	17.5	12 P	28.7	27.5	23.3	2
12	30.38	30.14	30.303	27.0	3 P	14.0	12 P	20.5	18.6	16.5	3
13	30.37	30.11	30.196	15.0	2:30 P	9.0	6:30 A	12.0	11.6	11.0	0
14	30.37	30.15	30.492	23.5	1 P	4.0	12 P	13.7	13.7	11.0	8
15	30.75	30.58	30.695	24.5	4 P	−3.5	4 A	10.5	12.1	13.8	1
16	30.58	29.75	30.051	49.0	6 P	18.5	0 A	33.7	33.7	34.5	0
17	29.82	29.72	29.787	41.0	0 A	33.0	6 A	37.0	34.7	30.2	2
18	29.85	29.65	29.724	37.5	1 P	28.0	6:30 A	32.7	32.9	30.0	1
19	30.01	29.73	29.845	45.0	3:30 P	21.0	4 A	33.0	34.5	32.7	8
20	30.50	30.01	30.356	38.0	3 P	22.0	12 P	30.0	29.0	24.5	8
21	30.53	29.80	30.268	35.0	10 P	20.0	5 A	27.5	27.6	28.2	0
22	29.91	29.68	29.857	48.0	1 P	33.0	0 A	40.5	41.1	38.7	5
23	30.31	29.91	30.154	40.0	0 A	16.0	12 P	28.0	27.5	22.7	4
24	30.36	30.19	30.278	26.0	3:30 P	8.5	8:30 A	17.3	15.3	13.2	9
25	30.19	29.77	29.926	30.0	2 P	12.0	3 A	21.0	21.9	23.5	0
26	29.80	29.72	29.758	30.5	3 P	24.0	11 P	27.3	27.0	25.3	0
27	29.87	29.73	29.784	31.0	1 P	10.0	12 P	20.5	20.1	15.7	8
28	30.15	29.87	30.028	26.5	3 P	−3.5	8 A	11.5	13.7	12.8	4
29	30.25	30.00	30.114	36.0	12 P	7.5	9 A	21.7	23.5	23.3	1
30	30.21	30.03	30.106	41.0	2 P	22.0	12 P	31.5	30.4	25.2	9
31	30.29	30.20	30.264	36.0	3 P	18.0	12 P	27.0	26.2	21.2	9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	23.7	.183	74.7	S.W.	78	2.0	20	4 P				
2	26.0	.206	74.7	E.S.E.	94	0.5	10	3 P				
3	35.7	.230	92.7	N.E.	63	0.0	—	—	0 A	12 M	.15	
4	26.7	.303	71.0	W.N.W.	157	5.5	33	4 A				
5	8.0	.117	65.7	N.W.	340	11.5	48	1 P	4 A	3 P	.29	3.0
6	−4.7	.082	52.7	W.N.W.	59	0.0	—	—				
7	1.0	.076	68.0	E.N.E.	3	0.0	—	—	6 A	3:30 P	.26	2.5
8	−0.3	.077	61.7	W.N.W.	193	12.5	50	12 M				
9	−21.7	.032	51.0	N.W.	157	3.5	26	1 A				
10	15.0	.127	83.0	W.	88	1.5	17	3 P	6 A	1 P	.06	1.0
11	19.7	.135	81.7	N.N.W.	148	5.5	33	2 A	4:30 P	12 P	*	*
12	10.0	.107	71.0	N.	176	2.0	20	9 A	0 A	6 A	.18	1.5
13	7.7	.077	84.0	N.W.	306	5.0	32	3 P	6 A	12 P	*	*
14	0.0	.088	59.3	N.W.	280	5.5	33	10 A	0 A	7:30 A	.70	7.0
15	10.7	.094	83.3	N.N.W.	20	0.0	—	—	11 P	12 P	*	*
16	33.3	.209	96.3	S.S.E.	58	7.0	38	6 P	0 A	11:30 P	.98	3.0
17	23.7	.203	66.7	W.S.W.	167	6.0	35	1 P				
18	24.0	.189	69.7	W.S.W.	165	9.5	44	8 P	2 P			T.
19	25.7	.220	65.3	S.S.W.	165	2.0	20	5 P				
20	16.3	.158	66.0	N.N.W.	87	0.0	—	—				
21	25.7	.163	88.3	N.N.W.	34	0.0	—	—	7 A	12 P	.72	T.
22	34.3	.265	77.7	W.	86	1.5	17	12 M	0 A	4 A	.20	
23	17.0	.137	73.3	N.N.W.	268	4.5	30	1:30 P				
24	4.7	.094	64.0	N.N.W.	179	3.0	24	3 A				
25	22.0	.133	91.7	N.N.W.	110	0.0	—	—	7:30 A	12 P	*	*
26	22.0	.147	82.7	N.N.W.	100	0.0	—	—	0 A	3 A	.60	7.5
27	6.7	.107	60.0	S.	58	0.5	10	12 M	2 A	5 A	.04	1.0
28	5.3	.098	66.7	S.	66	1.0	14	3 P				
29	20.3	.142	86.3	S.S.E.	147	5.5	33	5 P	1:30 P	10 P	.07	T.
30	15.3	.171	61.3	W.	69	0.0	—	—	4 A	5 A	.02	
31	10.3	.139	56.3	S.	97	0.0	—	—				

**Rain or melted snowat base of tower. *Included in following day.

Annual Summary for 1902.

Pressure. In inches.

Maximum reduced to freezing, ... 30.42, Dec. 15th, 10 A.
Minimum reduced to freezing, ... 28.54, Feb. 17th, 11 P.
Maximum reduced to freezing and sea-level, ... 30.75, Dec. 15th, 10 A.
Minimum reduced to freezing and sea-level, ... 28.86, Feb. 2d, 6 P., 17th, 11 P.
Mean reduced to freezing and sea-level, ... 29.954
Annual range, ... 1.89

****Air Temperature.*** In degrees Fahr.

Highest, ... 91.0, May 23d, 4 P.
Lowest, ... —15.0, Dec. 10th, 1 A.
Mean, ... 47.3
Mean of means of max. and min., ... 47.2
Mean sensible (wet bulb), ... 43.1
Annual range, ... 106.0
Highest mean daily, ... 79.0, July 9th.
Lowest mean daily, ... —6.0, Dec. 9th.
Mean maximum, ... 57.6
Mean minimum, ... 36.9
Mean daily range, ... 20.7
Greatest daily range, ... 54.0, Dec. 10th.
Least daily range, ... 3.0 Nov. 27th.

Humidity.

Mean dew point, ... 37.7
Mean force of vapor, ...402
Mean relative humidity, ... 71.6

Wind.

Prevailing direction, ... Northwest.

Summary.

West, ... 12 per cent.
East, Northeast, ... 10 " "
West, Southwest, ... 10 " "
North, ... 9 " "
Northwest, ... 9 " "
Other directions, ... 50 " "
Total movement, ... 48438 m.
Greatest daily movement, . . . 596 m., Mar. 19th.
Least daily movement, ... 3 m., Dec. 7th.
Mean daily movement, ... 132.7 m.
Mean hourly velocity, ... 5.53 m.

*Temperature in ground shelter.

S. C. BACON,
Observer.

Maximum pressure per square foot, 24.0 lbs.=69 m. per hour, Feb. 3d, 4 P. M., N.N.W.; Mar. 19th, 3 P, M., E.N.E.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 46.99
Number of days on which .01 or more rain or melted snow fell, ... 144
Snow total in inches, ... 57.0

Weather.

Mean cloudiness observed, ... 60 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2589=58 per cent.
Number of clear days, ... 73
Number of fair days, ... 113
Number of cloudy days, ... 179

Bright Sunshine.

Number of hours recorded, . . 1864=42 per cent.

Dates of Frosts.

Last, ... May 14th.
First, ... Sept. 6th.

Dates of Snow.

Last, ... Apr. 2d.
First, ... Oct. 29th.
Total days of sleighing, ... 44

Gales of 50 or More Miles Per Hour.

Feb. 60 m., 2d, N.N.W.; 69 m, 3d, N.N.W.,
Mar. 69 m., 19th, E.N.E.
Apr. 53 m., 27th, N.W.
June 50 m., 3d, E.N.E.; 55 m., 26th, N.
Dec. 50 m., 8th, W.S.W.

J. E. OSTRANDER,
Meteorologist.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 169. JANUARY, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.28, 30th, 11 A.
Minimum reduced to freezing,	28.81, 8th, 4 A.
Reduced† maximum reading,	30.62, 20th, 11 A.
Reduced† minimum reading,	29.13, 8th, 4 A.
Mean tri-daily reduced,	29.906
Monthly range,	1.49

****Air Temperature.*** In Degrees Fahr.

Highest,	45.5, 2d, 3 P.
Lowest,	—12.0, 20th, 9 A.
Mean hourly,	24.3
Mean of means of max. and min.,	24.2
Mean sensible (wet bulb),	22.5
Monthly range,	57.5
Highest mean daily,	37.5, 4th
Lowest mean daily,	3.0, 19th
Mean maximum,	32.5
Mean minimum,	15.8
Mean daily range,	16.7
Greatest daily range,	38.0, 20th
Least daily range,	6.0, 3d, 4th

Humidity.

Mean dew point,	16.0
Mean force of vapor,	.147
Mean relative humidity,	72.1

Precipitation. In inches.

Total precipitation,	3.28
Number of days on which .01 inch or more rain or melted snow fell,	10.
Snow, total in inches,	8.5
Snow on ground at end of month,	3.0

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4254m.
Greatest daily movement,	381m., 31st.
Least daily movement,	9m., 20th.
Mean daily movement,	137 m.
Mean hourly velocity,	5.7 m.

Maximum pressure per square foot, 12.5 lbs.= 50 m. per hour, 31st, 11:30 A. M., W.

Prevailing Direction, West, Southwest.

Summary.

West, Northwest,	13 per cent.
West,	13 " "
West, Southwest,	13 " "
Northwest,	10 " "
Southwest,	10 " "
South, Southeast,	10 " "
Other directions,	31 " "

Weather.

Mean cloudiness observed,	61 per cent.
Total cloudiness recorded by the Sun Thermometer,	180 hrs.=61 per cent.
Number of clear days,	6
Number of fair days,	9
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, 114 hrs.=39%

Rain, 2d, 3d, 6th, 7th, 11th, 21st, 25th, 26th, 28th, 29th, 30th.

Snow, 6th, 7th, 11th, 15th, 16th, 25th, 26th, 30th.

Gales, 35 miles or more per hour, 46m. 12th, W.S.W.; 35m. 13th, S.S.W.; 42m. 18th, W.; 37 m. 23d, W.N.W.; 41m. 30th, W.S.W.; 50m. 31st, W.

Number of days sleighing, 31

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.24	30.14	30.189	44.5	3 P	11.0	8 A	27.7	27.3	24.2	9
2	30.26	30.06	30.177	45.5	2 P	16.0	8 A	30.7	31.5	29.0	6
3	30.06	29.48	29.563	38.0	2 P	32.0	3:30 A	35.0	35.7	35.7	0
4	29.68	29.56	29.616	40.0	12 M	34.0	0 A	37.0	37.5	34.0	0
5	29.81	29.58	29.760	41.0	1:30 P	30.0	8 A	35.5	34.4	30.5	4
6	29.80	29.46	29.535	34.5	2:30 P	22.0	12 P	28.3	30.2	29.2	0
7	29.61	29.23	29.442	26.0	2 P	13.5	8 A	19.7	21.3	20.5	2
8	29.42	29.13	29.264	32.0	1 P	14.5	3 A	23.3	21.1	19.2	3
9	29 64	29.43	29.582	17.0	3 P	5.5	7:30 A	11.3	13.5	11.0	8
10	30.15	29 64	29.987	24.0	3 P	7.0	8 A	15.5	15.4	13.5	4
11	30.20	29 27	29.792	25.0	8 P	6.0	8 A	15.5	13.8	14.0	0
12	29.86	29 26	29.693	31.0	4 A	13.0	12 P	22.0	21.2	17.5	8
13	30.20	29.86	30.068	22.5	3 P	11.0	6 A	16.7	16.2	14.8	9
14	30.27	29.99	30.162	26.0	3:30 P	8.0	2 A	17.0	16.6	16.5	4
15	29.99	29.73	29.774	34.0	6 P	19.0	0 A	26.5	28.1	27.7	1
16	29 91	29 77	29.890	37.5	4 P	29.5	1:30 A	33.5	34.0	30.7	1
17	29.81	29.44	29.529	45.0	3 P	28.5	6 A	36.7	36.0	33.0	4
18	30.25	29.50	29.971	33.0	0 A	3.0	12 P	18.0	13.7	7.3	8
19	30.60	30.25	30.506	15.0	4 P	−8.5	5 A	3.3	3.0	0.7	9
20	30.62	30.27	30.497	26.0	4 P	−12.0	9 A	7.0	7.0	9.2	7
21	30.27	29 36	29.589	43.0	4 P	21.5	0 A	32.3	35.0	35.5	2
22	29.95	29.69	29.888	36.0	12 M	29.0	6 A	32.5	33.0	30.0	0
23	30.36	29.90	30.050	35.0	12 M	7.0	12 P	21.0	23.6	20.5	5
24	30.51	30.36	30.452	16.5	3 P	0.0	6:30 A	8.3	9.5	7.2	6
25	30.40	30.26	30.303	20.0	3 P	10.0	8 A	15.0	14.5	14.3	0
26	30.46	30.31	30.424	29.0	2 P	12.5	7:30 A	20.7	20.7	19.8	1
27	30.43	30.13	30.252	36.5	12 P	23.5	0 A	30.0	31.7	31.2	3
28	30.13	29.90	29.969	45.0	4:30 P	29.0	12 P	37.0	36.6	35.3	2
29	29.99	29.66	29.876	39.0	4 P	27.0	8 A	33.0	32.9	33.2	1
30	29.66	29.28	29.419	40.0	1 P	26.0	12 P	33.0	32.8	30.2	1
31	30.00	29 58	29.862	31.0	3 P	22.0	9 P	26.5	26.7	23.2	6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	9.3	.183	51.7	E.S.E.	37	0.0*	—	—				
2	20.7	.203	67.3	E.S.E.	32	0.0	—	—	9 P	12 P	.05	
3	33.7	.216	88.7	N.E.	92	0.0	—	—	0 A	10:30A	.72	
4	28.0	.216	69.0	W.N.W.	96	3.0	24	3 A				
5	23.0	.199	63.7	W.	77	0.5	10	4 A				
6	27.7	.168	89.0	S.S.E.	89	1.0	14	7 P	0 A	6 P	.08	1.0
7	16.0	.121	79.0	S.W.	90	0.5	10	3 P	12 M	10 P	.20	2.5
8	10.0	.121	63.0	W.N.W.	81	1.5	17	3 P				
9	4.3	.078	69.7	W.N.W.	200	4.0	28	6 P				
10	5.7	.093	64.3	S.S.W.	210	3.0	24	3 P				
11	12.0	.090	88.3	S.E.	55	0.5	10	9 P	12 M	7:30 P	.68	4.0
12	11.0	.115	66.3	W.S.W.	294	10.5	46	3 P				
13	8.0	.097	68.3	W.S.W.	280	6.0	35	1 A				
14	11.3	.103	74.3	S.	96	0.5	10	4 P				
15	24.3	.167	80.3	S.	190	3.5	26	3 P	8 P	9 P		T.
16	25.3	.193	73.0	S.W.	222	3.0	24	4 A	8 A	12 M		T.
17	26.7	.221	70.0	S.W.	178	5.5	33	10 P				
18	−7.0	.073	45.0	W.	330	9.0	42	6 A				
19	−21.7	.056	36.7	N.N.W.	55	0.0	—	—				
20	0.0	.090	62.7	E.	9	0.0	—	—				
21	33.0	.221	86.0	N.N.W.	140	3 5	26	10 P	2 A	12 M	1 14	
22	25.0	.184	74.7	W.N.W.	105	1.0	14	3 P				
23	16.3	.124	78.7	W.	169	7.0	37	2 P				
24	−6.7	.072	58.3	N.W.	146	1.5	17	9 A				
25	11.3	.091	83.7	N.W.	228	2.0	20	3 P	6 A	3 P	.04	1.0
26	14.7	.125	72.3	N.W.	45	0.0	—	—	6 A			T.
27	28.7	.186	87.3	S.S.E.	191	2.0	20	2 P				
28	33.3	.217	89.3	S.S.E.	62	0.0	—	—	6:30 A	10:30A	.06	
29	31.7	.196	92.7	W.S.W.	27	0.0	—	—	4:30 P	12 P	.08	
30	24.3	.189	73.7	W.S.W.	147	8.5	41	10 P	0 A	8 P	.23	T.
31	15.7	.142	68.3	W.	381	12.5	50	12:30 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

Seasonable wintry weather was generally prevalent during the month. The heavy snowfall of December together with a few light snowstorms during the month was sufficient to keep the ground well covered. Sleighing was good throughout the month although thin in a few places after the foggy weather of the 29th.

Three well defined periods of low temperature culminated on the 9th, 19th and 24th. Each period lasted about three days: zero temperature was not reached on the first date but considerable wind made it very unpleasant.

The barometric pressure was very unsteady during the month. The fluctuations were large and some of the drops unusually rapid. On the 11th the fall was nearly an inch, while on the 20th-21st a range of more than $1\frac{1}{4}$ inches was noted in 28 hours. The mean barometer was, .15 in. lower than normal and the monthly range was slightly less than usual. The total wind movement was about 90 per cent of the normal and nearly all came from the western points of the compass.

The mean temperature was slightly above the normal and the range normal. Both the maximum and minimum however were more than 5 degrees lower than the usual January records. The mean dew point and relative humidity were both unusually low.

The total precipitation was about 10 per cent less than the average, one inch of it falling as snow. More than one half the total fell durthe rains of the 3d and 21st. The percentage of cloudiness was very high. The amount in the evenings was much less than in the mornings.

J. E. OSTRANDER, Meteorologist.

S. C. BACON, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 170. FEBRUARY, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.15, 20th, 11 P.
Minimum reduced to freezing,	28.61, 17th, 3 A.
Reduced† maximum reading,	30.48, 20th, 11 P.
Reduced† minimum reading,	28.93, 17th, 3 A.
Mean tri-daily reduced,	29.980
Monthly range,	1.55

****Air Temperature.*** In Degrees Fahr.

Highest,	57.0, 28th, 6 P.
Lowest,	—11.0, 21st, 8 A.
Mean hourly,	27.3
Mean of means of max. and min.,	27.2
Mean sensible (wet bulb),	25.7
Monthly range,	68.0
Highest mean daily,	47.5, 28th
Lowest mean daily,	3.3, 18th
Mean maximum,	36.0
Mean minimum,	18.4
Mean daily range,	17.6
Greatest daily range,	45.0, 21st
Least daily range,	5.0, 2d

Humidity.

Mean dew point,	21.0
Mean force of vapor,	.169
Mean relative humidity,	77.7

Precipitation. In inches.

Total precipitation,	4.27
Number of days on which .01 inch or more rain or melted snow fell,	9
Snow, total in inches,	12.0
Snow on ground at end of month,	Trace

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4529m.
Greatest daily movement,	359m., 9th.
Least daily movement,	7m., 2d.
Mean daily movement,	162 m.
Mean hourly velocity,	6.7 m.

Maximum pressure per square foot, 22.0 lbs.= 66 m. per hour, 12th, 12 M., W.

Prevailing Direction, West.

Summary.

West,	29 per cent.
Northwest,	11 " "
West, Northwest,	11 " "
Southwest,	11 " "
Southeast,	11 " "
Other directions,	27 " "

Weather.

Mean cloudiness observed,	53 per cent.
Total cloudiness recorded by the Sun Thermometer,	151 hrs.=51 per cent.
Number of clear days,	11
Number of fair days,	6
Number of cloudy days,	11

Bright Sunshine.

Number of hours recorded, . . . 145 hrs.=49%

Rain, 2d, 4th, 8th, 11th, 12th, 27th, 28th.

Snow, 1st, 5th, 7th, 8th, 15th, 16th, 17th, 18th

Gales, 35 miles or more per hour, 46m. 5th, W.N.W.; 35m. 6th W.N.W.; 56m. 9th, S. W.; 66 m. 12th, W.; 36m. 17th, N.N.W.; 36m. 18th, S.S.W.; 35m. 19th, W.; 58m. 28th, S.S.W.

Number of days sleighing, ... 18

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.09	29.95	30.022	37.5	3 P	21.0	2 A	29.3	29.7	29.3	1
2	29.99	29.80	29.909	36.0	2 P	31.0	6 A	33.5	33.5	33.5	0
3	30.03	29.80	29.976	45.5	4:30 P	29.0	12 P	37.3	37.3	33.2	9
4	29.98	29.03	29.380	38.0	3 P	29.0	0 A	33.5	34.5	35.2	0
5	29.72	29.14	29.423	34.0	0 A	21.0	9 P	27.5	26.6	25.0	5
6	30.08	29.72	30.020	36.0	3 P	20.5	3 A	28.3	28.0	25.3	8
7	30.31	30.08	30.253	34.0	5 P	20.0	12 P	27.0	27.4	24.6	8
8	30 30	29.43	29.812	33.0	11 P	13.5	7:30 A	23.3	22.0	23.0	0
9	30.03	29.51	29.806	32.5	4 P	21.5	9 A	27.0	27.7	25.2	9
10	30.17	30.03	30.134	44.5	4 P	19.5	7:30 A	32.0	32.0	29.0	9
11	30.10	29.22	29.764	43 5	9:30 P	21.5	8 A	32.5	34'1	34.0	0
12	29.93	29.22	29.720	43.5	3:30 P	36.0	1 A	39.7	40.4	37.0	5
13	30.07	29.93	30.002	48.5	2:30 P	33.0	12 P	40.7	38.4	36.3	6
14	30.31	30.06	30.242	33.0	3 P	22.0	9 A	27.5	27.3	24.8	10
15	30.30	29.80	30.050	29.0	2:30 P	18.5	1:30 A	23.7	23.7	23.8	0
16	29 80	29.28	29.563	29.5	3 P	21.0	7 A	25.3	24.3	23.8	2
17	29.89	28.93	29.409	21.0	0 A	2.0	12 P	11.5	15.2	10.7	3
18	30.19	29.83	29.930	12.0	5 P	−5.0	8 A	3.5	3.3	2.5	2
19	30.41	30.10	30.353	13.5	5 P	1.0	9 A	7.3	5.3	4.3	10
20	30.48	30.36	30.439	28.5	3 P	−2.0	8 A	13.3	10.1	10.3	8
21	30.46	30.09	30.238	34.0	5 P	−11.0	8 A	11.5	14 6	17.0	6
22	30.44	30.04	30.243	31.0	3 P	19.0	1:30 A	25.0	25.0	22.7	6
23	30.45	30.17	30.255	40.5	4 P	13.0	7:30 A	26.7	27.7	24.8	11
24	30.24	30.09	30.167	42.0	3 P	22.0	12 P	32.0	32.0	29 0	4
25	30.38	30.10	30.271	36.5	4 P	16.5	8 A	26.5	26.2	24.8	11
26	30.37	30.29	30.340	43.0	5 P	16.5	6:30 A	29.7	33.1	29.0	10
27	30.36	30.07	30.227	51.5	2 P	27.0	3:30 A	39.3	39.5	36.3	2
28	30.07	29.23	29.492	57.0	6 P	38.0	3 A	47.5	47.5	46.5	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	25.7	.178	80.7	W.	48	0.0	—	—	7:30 A			T.
2	27.7	.195	95.3	N.W.	7	0.0	—	—	1:30 P	5:30 P	.12	
3	28.7	.212	75.7	W.	75	2.5	22	7 A				
4	34.0	.210	92.3	N.	76	0.0	—	—	3 A	12 P	1.56	
5	21.0	.146	81.0	W.	333	10.5	46	12 M	7 A			T.
6	18.7	.159	68.0	W.N.W.	213	6.0	35	3 P				
7	19.7	.148	73.3	W.N.W.	137	1.0	14	6 A	7 A	8 A		T.
8	21.3	.131	92.7	N.W.	96	5.0	33	12 P	9:30 A	7:30 P	.46	1.5
9	20.0	.150	76.0	W.S.W.	354	15.5	56	12 M				
10	22.7	.191	71.3	S.E.	64	0.0	—	—				
11	32.3	.211	90.0	S.S.E.	156	0.5	10	7 P	11 A	11:30 P	.65	
12	31.3	.252	72.0	W.S.W.	323	22.0	66	12 M	7 A		T.	
13	30.7	.249	74.3	W.	80	1.5	17	7 P				
14	19.3	.150	73.0	N.W.	260	3.5	26	8 A				
15	22.7	.133	94.3	W.	46	0.0	—	—	8:30 P	12 P	*	*
16	21.3	.134	90.0	N.N.W.	133	1.0	14	11 A	0 A	12 P	*	*
17	7.0	.078	79.3	N.N.W.	327	6.5	36	7 A	0 A	12 M	.94	10.5
18	0.0	.053	88.0	S.W.	225	6.5	36	11 P	12 M	1:30 P		T.
19	−2.0	.059	72.0	W.	229	6.0	35	5 A				
20	1.3	.088	66.0	S.W.	76	0.0	—	—				
21	13.3	.124	84.3	S.E.	88	3.0	24	4 P				
22	16.0	.138	69.3	W.	163	4.5	30	3 P				
23	16.3	.173	62.0	S.S.E.	255	2.5	22	5 P				
24	23.7	.183	74.7	W.N.W.	65	0.0	—	—				
25	20.0	.145	81.0	W.	120	2.0	20	1:30 P				
26	17.0	.206	53.3	S.W.	150	5.0	32	5:30 P				
27	29.0	.271	65.3	S.E.	137	2.0	20	8 P	10 P	12 P	.17	
28	43.3	.354	80.7	S.S.W.	293	6.5	58	4:30 P	0 A	5 P	.37	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The month of February with its twenty-eight days is generally able to crowd within its limits greater and more rapid changes of weather than any other month of the year. The past month proved no exception as an examination of the records shows. A heavy shower with thunder and lightning, a severe snowstorm, a severe cold snap, a rapid thaw and several high winds were all prominent features of the weather for the month.

On the 4th, 8th, 11th, 17th and 28th, the barometer chart showed pronounced minimums, and around these dates the principal storms of the month occurred. The mean pressure was slightly below the normal and the range normal. The total wind movement was only about 80 per cent of the normal notwithstanding that on ten dates the daily movement exceeded 200 miles. Much more than the usual percentage was from the western direction.

The mean temperature was three degrees above the normal and higher than any previous February record at this station excepting that of 1891. The range was eight degrees more than usual and exceeded only by the record for 1898. The maximum and minimum for the month were both well below the usual records. On the 21st the rise in temperature from 11 degrees below zero at 8 A. M., to 34 degrees above at 5 P. M., a total change of 45 degrees in 9 hours, exhibits a very unusual record for this station. The mean dew point and the relative humidity were both considerably above the normal. The total precipitation was 25 per cent more than normal, the greater part occurring as rain. The shower on the 4th and the snow storm of the 15th–17th were the most severe storms of the month. The warm rain on the last of the month carried off the snow rapidly and the small streams were greatly swollen. The total amount of sunshine was nearly normal.

J. E. OSTRANDER Meteorologist

S. C. BACON Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 171. MARCH, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.34, 3rd, 11 A.
Minimum reduced to freezing,	29.16, 31st, 10 A.
Reduced† maximum reading,	30.65, 3rd. 11 A.
Reduced† minimum reading,	29.46, 31st, 10 A.
Mean tri-daily reduced,	30.196
Monthly range,	1.19

****Air Temperature.*** In Degrees Fahr.

Highest,	76.0, 20th, 1 P.
Lowest,	19.0, 2d, 7:30A.
Mean hourly,	42.6
Mean of means of max. and min.,	42.9
Mean sensible (wet bulb),	39.3
Monthly range,	57.0
Highest mean daily,	57.9, 20th
Lowest mean daily,	29.2, 2d
Mean maximum,	52.3
Mean minimum,	33.4
Mean daily range,	18.9
Greatest daily range,	45.0, 14th
Least daily range,	4.0, 21st

Humidity.

Mean dew point,	34.6
Mean force of vapor,	.293
Mean relative humidity,	76.4

Precipitation. In inches.

Total precipitation,	6.40
Number of days on which .01 inch or more rain or melted snow fell,	12
Snow, total in inches,	1.0
Snow on ground at end of month,	none

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4169m.
Greatest daily movement,	300m., 31st.
Least daily movement,	10m., 13th.
Mean daily movement,	134 m.
Mean hourly velocity,	5.6 m.
Maximum pressure per square foot,	8.0 lbs.= 40 m. per hour, 1st, 1 P., W.
Prevailing Direction,	West Northwest.

Summary.

North,	13 per cent.
North Northwest,	19 " "
West, Northwest,	10 " "
South Southeast,	10 " "
East Southeast,	10 " "
Other directions,	38 " "

Weather.

Mean cloudiness observed,	63 per cent.
Total cloudiness recorded by the Sun Thermometer,	233 hrs.=63 per cent.
Number of clear days,	8
Number of fair days,	6
Number of cloudy days,	17

Bright Sunshine.

Number of hours recorded, 138 hrs.=37%

Rain, 5th, 7th, 8th, 9th, 11th, 17th, 21st, 22d, 23d, 24th, 25th, 28th, 30th, 31st.

Snow, 3rd, 5th, 25th, 28th.

Gales. 35 miles or more per hour, 40m. 1st, W.; 39 m. 27th, W.S.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.30	29.59	29.996	48.0	0 A	22.0	12 P	35.0	34.6	28.8	6
2	30 50	30.30	30.380	40.0	4 P	19.0	7:30 A	29.5	29.2	26.7	8
3	30.65	30.50	30.608	34.0	3 P	25.5	6 A	29.7	30.7	29.8	0
4	30.52	30.27	30.362	52.0	3 P	31.5	2 A	41.7	38.8	36.2	9
5	30.33	30.04	30.137	35.0	9 P	27.5	6 A	31.3	32.5	32.2	0
6	30.52	30.04	30.366	47.0	3 P	31.0	12 P	39.0	38.0	32.2	11
7	30.58	30.38	30.489	50.0	2:30 P	21.0	6:30 A	35.5	35.8	33.5	8
8	30.38	30.12	30.183	52.5	8 P	38.0	0 A	45.3	47.2	48.5	0
9	30.47	30.18	30.420	46.0	6 P	41.0	12 P	43.5	43.9	42.2	0
10	30.49	30.33	30.430	50.0	4 P	37.0	6:30 A	43.5	43.3	41.5	0
11	30.33	30.14	30.187	52.0	5 P	40.5	6 A	46.3	45.3	44.0	1
12	30.32	30.19	30.243	61.0	3:30 P	31.0	6:30 A	46.0	45.9	40.2	11
13	30.19	30.11	30.153	67.0	5 P	28.0	6:30 A	47.5	45.2	38.8	11
14	30.22	30.08	30.146	73.0	5 P	28.0	6:30 A	50.5	49.5	42.3	10
15	30.43	30.17	30.339	55.0	2 P	29.0	6:30 A	47.0	45.7	40.2	7
16	30.50	30.32	30.439	41.0	12 M	35.0	6:30 A	38.0	38.0	35.2	0
17	30.32	30 09	30.171	59.0	3 P	36.0	6 A	47.5	45.3	43.3	2
18	30.43	30.25	30.415	56.0	4 P	38.0	4:30 A	47.0	46.7	44.0	0
19	30.42	30.18	30.274	66.0	4 P	38.0	6:30 A	52.0	49.1	46.0	8
20	30.23	30.00	30.085	76.0	1 P	43.0	3 A	59.5	57.9	55.2	9
21	30.12	29.94	30.017	47.0	4 P	43.0	9 A	45.0	47.3	44.5	0
22	30.24	29.94	30.169	50.0	4 P	43.0	8 A	46.5	46.3	42.5	0
23	30.23	29.88	30.023	45.5	4 P	39.5	5 A	42.5	42.5	42.0	0
24	29.99	29 76	29.894	67.0	4:30 P	43.0	1 A	55.0	53.0	50.5	4
25	29.92	29.80	29.868	45.5	1:30 P	33.0	10 P	39.3	41.5	37.5	3
26	30.05	29.92	30.029	52.0	4:30 P	30.0	6 A	41.0	41.5	36.5	12
27	30.03	29.85	29.945	63.0	1 P	35.5	6:30 A	49.3	49.3	43.5	3
28	30.23	29.97	30.090	44.0	12 M	35.0	11 P	39.5	40.3	37.8	0
29	30.53	30.23	30.510	43.0	4 P	27.0	6 A	35.0	34.2	29.2	12
30	30.48	29.75	30.169	44.5	4 P	22.0	6 A	33.3	34.8	33.0	0
31	29.75	29.46	29.545	59.5	4 P	35.0	5 A	47.3	46.7	41.8	3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	20.7	.193	62.7	W.N.W.	294	8.0	40	1 P				
2	21.7	.187	76.0	W.S.W.	98	0.0	—	—				
3	27.3	.172	86.3	E.S.E.	110	0.0	—	—	8:30 A	9:30 A		T.
4	29.7	.261	68.3	S.	138	0.5	10	11 A				
5	30.3	.187	93.0	E.S.E.	21	0.0	—	—	9:30 A	4 P	.17	1.0
6	22.7	.226	58.7	N.	149	2.0	20	5 P				
7	26.7	.241	70.0	S.E.	88	2.5	22	2:30 P	6 P	12 P	.05	
8	47.3	.350	94.3	S.S.E.	176	1.5	17	9 P	0 A	11:30 P	1.27	
9	40.3	.282	89.3	N.N.W.	201	1.5	17	4 P	7 A	9 P	.02	
10	39.0	.288	83.3	S.S.W.	120	1.5	17	4 A				
11	42.3	.304	90.3	S.W.	114	1.0	14	11 P	1 A	8 A	.92	
12	33.0	.322	66.3	N.W.	97	3.0	24	1 P				
13	30.0	.341	62.0	N.N.W.	10	0.0	—	—				
14	33.0	.422	57.3	W.N.W.	17	0.0	—	—				
15	33.7	.308	67.3	N.	197	0.5	10	2 P				
16	31.0	.226	77.3	E.	99	0.5	10	10 P				
17	40.7	.313	85.7	S.S.E.	90	0.5	10	11 P	12:30 P	1:30 P	T.	
18	39.7	.335	74.7	E.S.E.	70	0.5	10	11 P				
19	42.3	.386	75.3	S.S.E.	200	1.5	17	2 P				
20	52.0	.559	78.3	S.S.W.	160	1.0	14	11:30 P				
21	43.3	.301	93.7	N.	114	1.0	14	3 A	5 A	12 P	.81	
22	38.0	.311	75.3	N.N.W.	111	0.5	10	11 A	0 A	12 P	.22	
23	41.0	.273	94.7	N.	109	0.0	—	—	0 A	10 P	1.95	
24	48.7	.417	87.7	W.N.W.	53	1.0	14	9 P	7:30 P	9:30 P	.07	
25	35.0	.243	85.0	W.S.W.	178	4.0	28	5 P	2 P	9:30 P	T.	T.
26	27.7	.273	58.0	W.	211	5.5	33	4 P				
27	35.7	.370	61.7	S.W.	204	7.5	39	3 P				
28	37.3	.236	93.0	N.N.W.	120	5.0	32	9 P	4 A	9:30 P	.15	T.
29	20 3	.195	59.3	N.N.W.	251	5.0	32	8:30 A				
30	28.3	.217	83.0	S.E.	69	0.5	10	12 M	5:30 P	12 P	.71	
31	35.0	.344	61.7	N.N.W.	300	4 5	30	11 A	0 A	3 A	.06	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during March was abnormal in many respects, yet as a whole was less disagreeable than usual. High temperature, large precipitation, high barometer and small wind movement were the most noticeable features. Early in the month the frost left the ground and by the 15th the roads were nearly dry. At that time the season was fully two weeks in advance of the usual spring conditions and this advance was maintained up to the close of the month.

The mean barometer for the month was fully .2 in above the normal and higher than for any preceding March since this station was established, excepting 1898. On only 11 days was the minimum below 30 in. The range was slightly smaller than usual. The total wind movement was abont 70 per cent of the normal and less than any previous March record here excepting that of 1898. Only two gales were noted during the month.

The mean temperature was more than 9 degrees above the normal and 2 degrees higher than the abnormal record of last year. The maximum was 3 degrees higher than the previous high record for the month. On only 2 days was the mean hourly temperature below freezing, and on but 13 dates did the minimum record fall below the freezing point. The mean dew point was about 8 degrees above the normal, and the relative humidity was nearly normal.

The total precipitation was 60 per cent more than the normal, nearly one-half the total falling in a single storm on the 21st-23d. The amount of cloudiness was large, although there were a number of clear days about the middle of the month.

J. E. OSTRANDER Meteorologist

S. C. BACON Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 172. APRIL, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.15, 6th, 8 A.
Minimum reduced to freezing,	29.01, 4th, 1 A.
Reduced† maximum reading,	30.46, 6th, 8 A.
Reduced† minimum reading,	29.31, 4th, 1 A
Mean tri-daily reduced,	29.872
Monthly range,	1.15

****Air Temperature.*** In Degrees Fahr.

Highest,	84.0, 30th, 2.30 P.
Lowest,	22.0, 6th, 6 A.
Mean hourly,	46.9
Mean of means of max. and min.,	47.1
Mean sensible (wet bulb),	41.7
Monthly range,	62.0
Highest mean daily,	66.6, 30th
Lowest mean daily,	30.6, 5th
Mean maximum,	59.3
Mean minimum,	35.0
Mean daily range,	24.3
Greatest daily range,	43.5, 28th, 29th
Least daily range,	7.5, 16th

Humidity.

Mean dew point,	34.1
Mean force of vapor,	.354
Mean relative humidity,	64.7

Precipitation. In inches.

Total precipitation,	2.30
Number of days on which .01 inch or more rain or melted snow fell,	9

Thunder and Lightning, 3rd.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5125m.
Greatest daily movement,	402m., 17th.
Least daily movement,	18m., 23rd.
Mean daily movement,	171 m.
Mean hourly velocity,	7.1 m.

Maximum pressure per square foot, 12.5 lbs.= 50 m. per hour, 18th, 12.30 P., W.S.W.

Prevailing Direction, West Northwest.

Summary.

Northwest,	13 per cent.
West, Northwest,	17 " "
South Southeast,	13 " "
West,	10 " "
North Northwest,	10 " "
North, Norththeast,	10 " "
Other directions,	27 " "

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	203 hrs.=50 per cent.
Number of clear days,	9
Number of fair days,	13
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded, 199 hrs.=50%

Rain, 2d, 3d, 4th, 7th, 8th, 9th, 10th, 13th, 16th.

Snow, 4th.

Gales. 35 miles or more per hour, 36m. 4th, W.; 48 m. 5th. W.N.W.; 46 m. 17th, N. N.W.; 50 m. 18th. W.S.W.; 36 m. 29th, W.N.W.; 30 m. 30th, S.S.E.

Frosts, 1st, 6th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.10	29.65	29.918	54.0	5 P	38.0	6:30 A	46.0	45.5	40.2	7
2	30 21	29.84	30.055	58.0	1:30 P	27.0	6 A	42.5	43.1	40.5	8
3	29.84	29.34	29.506	63.5	5 P	46.5	0 A	55.0	55.2	52.5	1
4	29.89	29.31	29.574	54.5	7 A	27.0	12 P	40.7	40.6	37.2	0
5	30.42	29.89	30.242	41.0	5 P	23.0	5 A	32.0	30.6	26.8	13
6	30.46	30.28	30.371	46.0	2:30 P	22.0	6 A	34.0	34.0	31.3	6
7	30.29	29.85	29.983	51.5	9 P	34.0	0 A	42.7	42.7	43.5	0
8	29.92	29.66	29.805	52.5	12 M	44.0	12 P	48.3	47.8	46.5	0
9	29.87	29.74	27.803	63.0	3 P	40.5	6 A	51.7	50.6	46.2	6
10	30.08	29.76	29.967	60.0	1:30 P	43.0	6 A	51.5	50.0	45.3	5
11	30.13	30.00	30.067	57.5	4 P	37.0	6 A	47.3	46.0	39.5	6
12	30 04	29.75	29.885	64.5	5 P	29.0	6 A	46.7	47.0	38.7	11
13	29.92	29.82	29.888	62.0	2:30 P	30.0	6 A	46.0	47.1	40.3	11
14	29.93	29.80	29.886	52.0	4:30 P	39.5	10 A	45.7	43.6	39.7	0
15	29.80	29.65	29.712	48.0	6 P	40.0	5 A	44.0	42.0	39.3	0
16	29.68	29.60	29.645	43.5	5 P	36.0	6 A	39.7	39.3	37.7	0
17	29.68	29 59	29.620	53.5	3:30 P	33.0	12 P	43.3	44.0	38.0	5
18	29.70	29.45	29.592	67.0	—	26.0	6 A	46.5	41.9	36.7	6
19	29.73	29.61	29.693	55.0	—	37.0	—	46.0	45.0	38.0	10
20	29.72	29.58	29.660	61.0	3 P	30.0	—	45.5	49.0	39.8	13
21	29.74	29.57	29.669	59 0	3 P	28.0	6 A	43.5	44 2	40.0	13
22	29.85	29.73	29.779	52.0	3 P	31.5	6 A	41.7	42.5	40.2	3
23	.2990	29.83	29.870	61.0	4 P	35.5	6 A	48.3	48.4	44.5	5
24	29.93	29.82	29.894	61.5	5 P	43.0	5 A	52.3	52.1	44.7	6
25	30.07	29.98	29.967	62.0	4 P	38.5	6 A	50.3	50.1	42.3	8
26	30.12	29.97	30.045	63.0	2:30 P	32.0	6 A	47.5	47.5	41.8	7
27	30.18	30.03	30.113	68.5	4 P	36.0	6 A	52.3	50.3	41.2	14
28	30.25	30.07	30.154	76.5	5 P	33.0	6 A	54.7	55.7	46.5	14
29	30.08	29.90	29.980	82.5	1 P	39.0	5:30 A	60.7	63.3	55.3	13
30	29.75	29.67	29.818	84.0	2:30 P	49.5	6 A	66.7	66.6	57.8	8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	33.3	.305	66.3	W.N.W.	177	2.5	22	1 P				
2	36.0	.312	74.7	S.S.E.	163	3.0	24	4 P	8 P	12 P	.13	
3	50.3	.437	84.3	S.E.	340	4.5	30	6 A	0 A	11 A	.30	
4	34.7	.253	88.0	W.	270	6.5	36	11 P	5:30 A	4:30 P	.06	T.
5	18.3	.174	62.0	W.N.W.	325	11.5	48	5 A				
6	22.3	.219	60.3	S.S.E.	110	2.0	20	5 P				
7	42.7	.294	96.3	S.S.E.	.91	1.0	14	7 P	6 A	10 P	.35	
8	45.3	.326	93.7	N.	114	1.5	17	8 P	11 A	10:30 P	1.15	
9	40.3	.388	73.7	S.W.	120	2.0	20	4 P	8 P	9 P	.04	
10	39.3	.369	69.3	N.W.	160	5.0	32	1 P	1 P	4:30 P	.01	
11	29.0	.323	56.0	N.W.	100	1.5	17	6 P				
12	26.7	.343	51.0	N.N.W.	84	1.5	17	6 P				
13	30.7	.347	59.3	N.N.E.	126	2.0	20	6 P				
14	36.3	.269	79.7	N.N.E.	313	2.5	22	6 P				
15	36.0	.257	86.7	N.N.E.	384	5.5	33	10 A	6 A	9 P	.22	
16	33.7	.250	78.3	N.	334	2.5	22	4 P	7 A	10:30 P	.04	
17	27.7	.296	53.7	N.N.W.	402	10.5	46	12 M				
18	24.0	.294	54.3	W.S.W.	233	12.5	50	12:30 P				
19	27.0	.300	50.3	W.S.W.	165	4.5	30	3 P				
20	28.3	.368	43.0	W.	147	5.0	32	3 P				
21	32.3	.325	62.0	W.N.W.	117	2.0	20	6 P				
22	34.3	.287	68.3	N.W.	106	0.0	—	—				
23	37.7	.367	65.3	W.	18	0.0	—	—				
24	34.0	.417	50.3	W.N.W.	83	1.5	17	1 P				
25	32.3	.388	53.7	N.W.	75	1.0	14	4 P				
26	31.0	.381	51.3	E.	93	0.5	10	6 P				
27	27.0	.401	46.0	N.N.W.	176	5.0	32	10 A				
28	34.7	.517	51.3	S.	29	0.0	—	—				
29	46.7	.677	54.7	W.N.W.	113	6.5	36	1:30 P				
30	50.7	.736	58.0	S.S.E.	158	7.5	39	12 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather for April was disappointing to those anticipating an early spring from the conditions prevailing during March. During a greater portion of the month the progress of the season was very slow and at the close of the month it was very little if any in advance of normal conditions. The departures from the normals of the month were small and unimportant.

The mean barometer was about one-eighth of an inch below the normal and the range was slightly greater than usual. The fluctuations were generally small and slow. The total wind movement was about normal; much of it coming from the northwest quadrant.

The mean temperature was about one degree higher than usual and only four degrees higher than for March. On the 18th a high wind blew over the thermometer shelter on the campus and the Draper thermometer was damaged so that for three days the hourly temperatures were not recorded. The mean tri-daily records for the 18th, 19th and 20th were used in making up the mean hourly record. The mean relative humidity was about one per cent lower than usual. During the last third of the month the humidity was abnormally low.

The total precipitation was about half an inch below the normal, nearly the whole falling during the first third of the month. Rain was needed when the month closed, the surface of the ground being very dry. About the usual amount of cloudiness was noted.

J. E. OSTRANDER. Meteorologist.

S. C. BACON, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 173. MAY, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.23, 2nd, 7 A.
Minimum reduced to freezing,	29.39, 1st, 0 A.
Reduced† maximum reading,	30.54, 2nd, 7 A.
Reduced† minimum reading,	29.69, 1st, 0 A.
Mean tri-daily reduced,	30.114
Monthly range,	.85

****Air Temperature.*** In Degrees Fahr.

Highest,	92.5, 20th, 1 P.
Lowest,	24.5, 2nd, 6 A.
Mean hourly,	59.2
Mean of means of max. and min.,	59.8
Mean sensible (wet bulb),	52.4
Monthly range,	68.0
Highest mean daily,	73.2, 20th
Lowest mean daily,	42.8 2nd
Mean maximum,	75.2
Mean minimum,	44.4
Mean daily range,	30.8
Greatest daily range,	45.0, 12th
Least daily range,	15.5, 28th

Humidity.

Mean dew point,	44.9
Mean force of vapor,	.572
Mean relative humidity,	61.3

Precipitation. In inches.

Total precipitation,	0.48
Number of days on which .01 inch or more rain or melted snow fell,	5

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3908m.
Greatest daily movement,	325m., 1st.
Least daily movement,	27m., 19th.
Mean daily movement,	126m.
Mean hourly velocity,	5.3m.
Maximum pressure per square foot, 9.5 lbs.= 44 m. per hour, 1st, 10 A., W.N.W.	
Prevailing Direction, Southwest.	

Summary.

Northwest,	10 per cent.
West, Southwest,	10 " "
South Southeast,	19 " "
West,	10 " "
North Northwest,	13 " "
South,	10 " "
Other directions,	28 " "

Weather.

Mean cloudiness observed,	36 per cent.
Total cloudiness recorded by the Sun Thermometer,	142 hrs.=31 per cent.
Number of clear days,	14
Number of fair days,	14
Number of cloudy days,	3

Bright Sunshine.

Number of hours recorded,	311 hrs.=69%

Rain, 4th, 7th, 14th, 28th, 30th.

Gales, 35 miles or more per hour, 44m. 1st, W.N.W.

Frosts, 2nd. Thin ice formed.

Thunder and Lightning, 14th, 28th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.42	29.69	30.148	52.0	4 P	33.0	12 P	42.5	46.3	36.2	11
2	30 54	30.35	30.464	58.5	4:30 P	24.5	6 A	41.5	42.8	37.7	14
3	30.41	30.12	30.263	56.5	5 P	36.5	5 A	46.5	45.9	44.2	2
4	30.16	30.07	30.113	68.0	5 P	46.0	6:30 A	57.0	54.3	50.8	8
5	30.20	30.08	30.156	66.5	2:30 P	47.0	6 A	56.7	55.4	49.2	10
6	30.17	30.00	30.084	71.5	4 P	49.5	6 A	60.5	57.0	51.7	11
7	30.05	29.90	30.001	71.0	12:30 P	39.5	6 A	55.3	51.2	47.8	7
8	30.14	30.02	30.092	76.0	4:30 P	38.0	6 A	57.0	56.8	50.0	10
9	30.24	30.14	30.193	76.5	1 P	39.0	5:30 A	57.7	60.0	52.0	14
10	30.30	30.16	30.245	78.5	3 P	41.0	5:30 A	59.7	60.0	51.7	14
11	30.33	30.21	30.292	80.5	4 P	39.0	6 A	59.7	60.3	49.0	14
12	30 37	30.28	30.335	81.0	2:30 P	36.0	5:30 A	58.5	59.3	50.2	14
13	30.34	30.12	30.249	77.5	3 P	43.0	5 A	60.3	59.4	54.8	10
14	30.12	29 83	29.949	80.5	3 P	52.0	6 A	66.3	60.5	57.0	6
15	30.04	29.87	29.923	78.0	3 P	51.0	6 A	64.5	61.3	55.3	11
16	30.23	30.04	30.190	77.0	1:30 P	43.5	5:30 A	60.3	59.7	53.5	11
17	30.23	30 00	30.113	85 5	4 P	45.0	5:30 A	65.3	65.2	58.8	14
18	30.05	29.88	29.957	91.5	4:30 P	48.0	6 A	69 7	69.8	60.8	14
19	29.97	29.83	29.899	91.5	3 P	53.5	5 A	72.5	71.2	63.5	10
20	29.89	29.79	29.861	92.5	1 P	56.0	5 A	74.3	73.2	62.3	10
21	29.98	29.84	29.913	87.5	3 P	55.5	5:30 A	71.5	71 4	60.8	10
22	29.93	29.71	29.801	85.0	12 M	54.0	12 P	69.5	70.5	59.5	10
23	30.12	29.92	30.001	71.0	3:30 P	46.0	5:30 A	58.5	57.1	46.7	15
24	30.18	30.07	30.137	67 5	4 P	41.0	5 A	54.3	52.8	46.3	6
25	30.33	30.15	30.255	72.5	5 P	36 5	5:30 A	54.5	55.4	47.0	15
26	30.35	30 27	30.324	72.0	3 P	38.5	5:30 A	55 3	55.8	49.2	7
27	30.28	30 07	30.177	69.5	5 P	49 0	5 A	59.3	61.0	58.0	2
28	30.07	29.95	30.019	73.5	4 P	58.0	12 P	65.7	64.7	63.2	2
29	30.13	30.04	30.097	79.0	3:30 P	51.5	5 A	65.3	64.0	56.2	8
30	30.12	30.00	30.073	72.0	4 P	47.0	12 P	59.5	57 2	50.3	9
31	30.29	30.12	30.203	71.0	4 P	38.5	5:30 A	54.7	55.1	50.8	12

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	22.0	.287	46.3	W.N.W.	325	9.5	44	10 A				
2	30.0	.293	65.3	E.S.E.	120	0.0	—	—				
3	39.3	.349	72.0	S.E.	220	0.0	—	—				
4	47.3	.438	79.3	W.	66	0.0	—	—	2 A	9 A	.14	
5	42.0	.459	61.7	N.	217	2.0	20	6 P				
6	45.0	.506	63.3	N.N.W.	159	1.5	17	2 A				
7	45.0	.381	81.3	W.S.W.	85	3.5	26	2:30 P	12:30 P	4 P	.05	
8	42.3	.530	61.0	N.W.	120	1.5	17	10 A				
9	42.3	.573	53.3	E.	93	1.0	14	3 P				
10	40.7	.603	52.3	S.S.E.	120	0.5	10	8 P				
11	36.0	.601	44.3	S.	97	1.0	14	7 P				
12	39.3	.607	51.3	S.	69	0.5	10	5 P				
13	50.3	.576	71.3	S.S.E.	142	1.0	14	6 P				
14	53.3	.616	76.0	S.S.E.	109	1.5	17	8 P	7 P	8 P	.07	
15	49.3	.603	66.0	N.N.W.	90	1.5	17	10 A				
16	45.7	.585	60.0	E.S.E.	73	0.5	10	4 P				
17	52.3	.738	62.7	S.E.	130	0.5	10	5 P				
18	55.3	.824	62.3	S.	59	0.0	—	—				
19	58.0	.876	62.7	S.W.	27	0.0	—	—				
20	54.7	.896	56.0	W.S.W.	88	2.5	22	2 P				
21	52.7	.831	54.0	S.W.	75	0.5	10	2 P				
22	52.0	.761	56.7	N.W.	177	3.5	26	2:30 P				
23	32.7	.513	39.0	N.W.	161	2.0	20	1:30 P				
24	36.3	.443	52.3	W.	46	0.0	—	—				
25	35.7	.485	48.0	W.S.W.	77	1.0	14	9 P				
26	41.3	.488	59.7	S.S.E.	170	2.5	22	4 P				
27	54.3	.585	73.0	S.S.E.	230	2.5	22	7 P				
28	61.3	.639	85.7	S.S.E.	294	8.5	22	3 A	8:30 A	10 A	.21	
29	48.0	.663	55.7	W.	74	0.5	10	5 P				
30	44.3	.476	66.3	N.N.W.	80	0.5	10	2 A	6 A	7 A	.01	
31	43.7	.501	61.0	N.N.W.	115	1.5	17	3 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during May was pleasant and agreeable to an unusual degree. During the entire month only three cloudy days were noted and the precipitation was less than half an inch. Considered in connection with the weather of the preceding month the drought has been most unusual for this locality.

From the 10th of April up to the close of May, a period of 51 days, the precipitation scarcely equalled three-fourths of an inch. The record for May alone is the smallest precipitation record for any month since this station was established with the single exception of August, 1894, when but .31 in. was recorded.

The drought has materially affected vegetation and the hay crop will be very light. Early fruit have also suffered severely. Although the dry weather has greatly checked vegetation, a copious rainfall in the next few days would greatly benefit most crops.

Other features of the weather for the month were the high mean barometer, with small fluctuations: a small wind movement with but a single gale; a large amount of sunshine and very low humidity.

The mean temperature was about 2 1-2 degrees higher than the normal and the range more than 12 degrees greater than usual. The minimum temperature of 24 1-2 degrees was lower than any previous record for the month excepting that for 1900, when 24 degrees was reached. Thin ice was formed but the damage from frost was very little. The maximum temperature was higher than any previous May record here, excepting only that of 1896.

The outlook for fall fruit is not very promising. Peaches were killed by the early frosts, apples will be only a partial crop, plums promise a good yield.

J. E. OSTRANDER Meteorologist

S. C. BACON Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 174. JUNE, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.09, 5th, 7 A.
Minimum reduced to freezing, 29.13, 12th, 12 M.
Reduced† maximum reading, 30.39, 5th, 7 A.
Reduced† minimum reading, 29.42, 12th, 12 M.
Mean tri-daily reduced, ... 29.941
Monthly range, ...97

****Air Temperature.*** In Degrees Fahr.

Highest, ... 86.5, 3rd, 3 P.
Lowest, ... 38.0, 6th, 5.30 A.
Mean hourly, ... 59.6
Mean of means of max. and min., ... 60.3
Mean sensible (wet bulb), ... 56.8
Monthly range, ... 48.5
Highest mean daily, ... 70.5, 10th
Lowestmean daily, ... 52.5, 5th
Mean maximum, ... 69.8
Mean minimum, ... 50.7
Mean daily range, ... 19.1
Greatest daily range, ... 42.0, 3rd
Least daily range, ... 3.5, 15th

Humidity.

Mean dew point, ... 53.7
Mean force of vapor, ...550
Mean relative humidity, ... 81.1

Precipitation. In inches.

Total precipitation, ... 7.79
Number of days on which .01 inch or more rain or melted snow fell, ... 14

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 3130m.
Greatest daily movement, ... 279m., 12th.
Least daily movement, ... 27m., 5th.
Mean daily movement, ... 104m.
Mean hourly velocity, ... 4.3m.
Maximum pressure per square foot, 9.0 lbs.= 43 m. per hour, 12th, 4 P., S.S.E.
Prevailing Direction, Southeast.

Summary.

South Southeast, ... 17 per cent.
Southeast, ... 13 " "
Southwest, ... 10 " "
West, ... 10 " "
Other directions, ... 50 " "

Weather.

Mean cloudiness observed, ... 71 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 355 hrs.=78 per cent.
Number of clear days, ... 4
Number of fair days, ... 4
Number of cloudy days, ... 22

Bright Sunshine.

Number of hours recorded, . . . 102 hrs.=22%

Rain, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 18th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 29th, 30th.

Gales, 35 miles or more per hour, 43m. 12th, S.S.E.

Thunder and Lightning, 10th, 11th, 29th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.33	30.14	30.243	78.0	5 P	39.5	4 A	58.7	58.4	52.3	15
2	30.28	30.14	30.212	77.5	5 P	47.0	6 A	62.3	61.4	52.0	14
3	30.14	29.88	29.998	86.5	3 P	44.5	4:30 A	65.5	66.7	56.5	12
4	30.32	30.05	30.226	69.0	3 P	46.5	6 A	57.7	55.3	50.2	0
5	30.39	30.29	30.349	67.0	5 P	39.0	6 A	53.3	52.5	49.7	0
6	30.33	30.15	30.226	68.0	4 P	38.0	5:30 A	53.0	54.2	50.8	0
7	30.15	30.01	30.071	72.5	1 P	52.0	2 A	62.3	62.4	61.3	0
8	30.01	29.86	29.910	69.5	12 M	62.0	2 A	65.7	64.6	63.5	0
9	29.95	29.86	29.910	80.0	5 P	61.5	6:30 A	70.7	68.5	66.5	4
10	30.00	20.92	29.958	82.0	12 M	61.0	12 P	71.5	70.5	66.8	4
11	29.97	29.85	29.920	79.0	12 M	60.0	3 A	69.5	66.0	65.7	3
12	29.85	29.42	29.603	72.5	3 P	61.5	6 A	67.0	65.7	64.7	1
13	29.78	29.66	29.709	73.0	3:30 P	54.0	12 P	63.5	62.3	59.0	7
14	29.80	29.69	29.751	65.0	5 P	50.0	5:30 A	57.5	56.5	56.2	1
15	29.72	29.63	29.683	56.5	5 P	53.0	0 A	54.7	54.8	53.7	0
16	29.89	29.72	29.872	65.0	4:30 P	44.0	12 P	54.5	54.6	51.3	2
17	29.94	29.84	29.894	70.0	2 P	40.5	5 A	55.3	55.6	52.8	7
18	29.98	29.93	29.965	58.5	5 P	51.5	6 A	55.0	55.0	53.7	0
19	29.95	29.82	29.868	66.5	3 P	52.5	5:30 A	59.5	57.9	56.8	1
20	29.88	29.72	29.817	65.0	1 P	55.5	6 A	60.3	58.4	58.2	1
21	29.79	29.67	29.719	57.5	6 P	52.0	10 P	54.7	54.9	54.2	0
22	30.01	29.79	29.955	63.0	3:30 P	51.0	6 A	57.0	56.0	54.0	0
23	29.98	29.93	29.957	57.5	1 P	51.0	6 A	54.3	53.4	50.8	0
24	30.05	29.95	30.027	59.0	5 P	49.0	5 A	54.0	52.6	50.7	1
25	30.03	29.93	29.976	63.5	5 P	48.5	5:30 A	56.0	55.5	54.7	1
26	29.99	29.88	29.939	77.5	4 P	53.0	6 A	65.3	63.5	59.8	11
27	29.92	29.76	29.840	80.0	2:30 P	49 0	5 A	64.5	65.1	60.2	6
28	29.90	29.82	29.874	74.0	5 P	48.0	5 A	61.0	62.8	57.0	7
29	29.91	29.86	29.898	66.0	1 P	53.0	5 A	59.5	58.0	57.7	0
30	29.93	29.76	29.861	77.0	3 P	54.5	5 A	65.7	65.7	63.5	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	43.3	.561	60.0	N.W.	47	0.0	—	—				
2	42.3	.582	53.7	W.	81	0.5	10	10 A				
3	47.0	.774	50.0	S.W.	129	2.5	22	11 A				
4	43.3	.436	69.0	S.W.	40	0.0	—	—				
5	45.3	.472	76.3	S.S.E.	27	0.0	—	—				
6	47.0	.466	75.7	S.	49	0.0	—	—				
7	59.7	.604	87.0	S.S.E.	104	0.5	10	7 P	10:30 A	12 P	.09	
8	62.7	.627	91.3	S.S.E.	240	2.0	20	12 M	0 A	4 P	.28	
9	64.3	.739	83.3	S.S.E.	72	0.0	—	—	6 A	1:30 P	T.	
10	65.0	.774	84.3	W.	98	0.5	10	8 P	6:30 P	7 P	.05	
11	64.7	.660	94.3	E.	53	0.0	—	—	1 P	12 P	.49	
12	63.3	.659	88.3	E.S.E.	279	9.0	43	4 P	0 A	12 P	.90	
13	56.0	.587	80.0	S.E.	163	2.0	20	8 A	0 A	9:30 A	.25	
14	55.0	.485	90.0	S.E.	112	0.0	—	—	10 A	12 P	.25	
15	52.7	.440	89.0	N.N.W.	133	4.5	30	3 P	0 A	7:30 P	1.69	
16	49.0	.428	83.3	N.	199	0.0	—	—				
17	49.3	.501	78.7	S.E.	61	0.5	10	4 P				
18	52.7	.439	90.3	E.S.E.	104	0.0	—	—	5:30 A	4 P	.08	
19	55.0	.510	86.7	S.E.	136	2.0	20	3 P	3:30 P	4 P	T.	
20	57.0	.504	94.3	E.N.E.	113	0.5	10	3 A	1 P	12 P	.17	
21	53.3	.427	97.0	N.	137	2.0	20	12 P	0 A	4:30 P	3.08	
22	51.7	.461	84.7	N.N.E.	145	1.0	14	1 A	9 A	11 A	T.	
23	47.7	.414	81.3	N.E.	150	1.5	17	2 P	3:30 P	6 P	T.	
24	48.7	.403	85.7	N.N.E.	106	0.0	—	—	4 P	10 P	.04	
25	52.0	.484	84.0	N.W.	30	0.0	—	—	9 P	10 P	.11	
26	57.0	.606	81.3	W.S.W.	56	0.0	—	—				
27	56.0	.678	71.7	W.	62	1.0	14	2:30 P				
28	52.0	.600	68.0	S.W.	37	0.0	—	—				
29	53.3	.506	90.7	E.	58	0.0	—	—	6 A	9 P	.31	
30	61.3	.678	83.3	S.S.E.	109	0.5	10	2 P	5 P	7 P	T.	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during June was disappointing and disagreeable, and in many respects unfavorable to vegetation. The drought which was so pronounced during May, continued through the first week in June and the remainder of the month was cold and rainy with but very little sunshine.

The smoke due to forest fires was first noticed on the 3d and by the 4th had become so dense that the sun was wholly obscured most of the day. On the 5th and 6th it gradually dissipated and had nearly disappeared by the morning of the 7th. A slight rainfall began on the 7th, and during the remainder of the month there were but five days without precipitation.

The mean barometer was slightly lower than the normal and the range large for the time of the year. The fluctuations were most pronounced the first part of the month though the pressure throughout the month was unsteady. The total wind movement was about eight-tenths of the normal, and the winds were much more changeable than usual.

The mean temperature was about six degrees below the normal and nearly two degrees lower than any previous June record at this station. The range was less than usual due to a rather low maximum. The mean dew point was over four degrees below the normal and the relative humidity was higher than any previous June record.

The total precipitation was more than twice the normal and made a new high record for the month. An unusually heavy rain occurred on the 15th and on the 21st over three inches fell in sixteen hours,—a record seldom equalled in this section.

The amount of sunshine noted was less than for any previous June at this station.

The outlook for crops is better than at the beginning of the month. Hay and corn have probably suffered most from the abnormal weather conditions of the past two months.

J. E. OSTRANDER Meteorologist.

F. F. HENSHAW, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 175. JULY, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.88, 5th, 8 A.
Minimum reduced to freezing, 29.31, 19th, 6 A.
Reduced† maximum reading, 30.17, 5th, 8 A.
Reduced† minimum reading, 29.60, 19th, 6 A.
Mean tri-daily reduced, ... 29.877
Monthly range, ...57

****Air Temperature.*** In Degrees Fahr.

Highest, ... 97.0, 9th, 4 P.
Lowest, ... 44.5, 28th, 6 A.
Mean hourly, ... 68.9
Mean of means of max. and min., ... 69.3
Mean sensible (wet bulb), ... 63.6
Monthly range, ... 52.5
Highest mean daily, ... 79.6, 9th
Lowest mean daily, ... 59.6, 15th
Mean maximum, ... 81.3
Mean minimum, ... 57.3
Mean daily range, ... 24.0
Greatest daily range, ... 37.0, 25th
Least daily range, ... 11.5, 21st

Humidity.

Mean dew point, ... 59.3
Mean force of vapor, ...778
Mean relative humidity, ... 71.4

Precipitation. In inches.

Total precipitation, ... 4.64
Number of days on which .01 inch or more rain or melted snow fell, ... 15

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 3087m.
Greatest daily movement, ... 261m., 2d.
Least daily movement, ... 19m., 13th.
Mean daily movement, ... 100m.
Mean hourly velocity, ... 4.2m.
Maximum pressure per square foot, 15.5 lbs.= 56 m. per hour, 29th, 7:30 P., S.W.
Prevailing Direction, Southwest.

Summary.

South Southeast, ... 26 per cent.
West, Northwest, ... 13 " "
North, Northwest, ... 16 " "
Southwest, ... 10 " "
South, ... 10 " "
Other directions, ... 25 " "

Weather.

Mean cloudiness observed, ... 52 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 215 hrs.=47 per cent.
Number of clear days, ... 10
Number of fair days, ... 12
Number of cloudy days, ... 9

Bright Sunshine.

Number of hours recorded, . . . 247 hrs.=53%

Rain, 1st, 5th, 6th, 10th, 12th, 13th, 14th, 15th, 16th, 18th, 19th, 20th, 21st, 22d, 29th, 30th.

Gales, 35 miles or more per hour, 39m. 2d, W.S.W.; 56m. 29th, S.W.

Thunder and Lightning, 10th, 12th, 14th, 20th, 21st, 22d, 25th, 29th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.83	29.67	29.743	86.0	5 P	64.0	5 A	75.0	74.0	70.5	8
2	29 82	29 65	29.703	88.0	4 P	65.0	12 P	76.5	79.4	68.0	14
3	29.92	29.82	29.890	83.0	2:30 P	62.0	5 A	72.5	73.0	66.3	8
4	30.10	29.92	30.014	83.0	2:30 P	54.5	5 A	68.7	68.5	60.8	15
5	30.17	30.02	30.094	82.0	3:30 P	54.5	4:30 A	68.3	67.4	63.0	7
6	30.07	29.95	30.013	86.5	4 P	62.5	5 A	74.5	70.3	67.0	8
7	30.09	29.99	30.051	86.0	6 P	56.0	5 A	71.0	71.6	64.3	11
8	30.02	29.85	29.922	92.0	4 P	60.0	4 A	76.0	76.2	66.5	12
9	29.89	29.81	29.860	97.0	4 P	63.0	5 A	80.0	79.6	71.2	14
10	29.88	29.73	29.795	93.0	1:30 P	66.0	5 A	79.5	77.2	73.0	10
11	29.77	29.67	29.738	87.0	1 P	61.0	12 P	74.0	74.5	67.0	9
12	29 76	29.66	29.720	89.0	3 P	54.0	5 A	71.5	71.6	67.3	10
13	29.76	29.68	29.724	73.5	3 P	58.5	12 P	66.0	67.3	61.0	0
14	29.82	29.71	29.771	80.0	3 P	53.5	5 A	66.7	63.2	58.3	6
15	29.85	29.74	29.805	69.5	12:30 P	52.0	12 P	60.7	59.6	54.0	5
16	29 94	29.83	29.868	75.0	6 P	51.5	5 A	63.3	62.5	57.5	3
17	30.01	29 94	29.981	81.5	4 P	48.5	5:30 A	65.0	66.8	59.7	12
18	29 98	29.72	29.880	73 0	1 P	52.0	5 A	62.5	60.5	60.0	1
19	29.79	29 60	29.690	69.5	3:30 P	57.0	12 P	63.3	62.6	61.2	3
20	29.90	29.78	29 864	76.0	1:30 P	54.0	2:30 A	65.0	64.0	62.5	6
21	29.99	29.88	29.922	72.0	2:30 P	60.5	6 A	66.3	63 5	63.2	2
22	30.03	29.85	29 947	82.0	2:30 P	61.5	5 A	71.7	68.4	66.8	4
23	29.90	29.81	29.856	80.5	4:30 P	61.0	12 P	70.7	70.0	65.5	6
24	30.03	29.89	26.964	83.0	3 P	56.5	5:30 A	69.7	68.7	60.5	15
25	30.07	29.90	29.984	88.0	4 P	51.0	5 A	69.5	71.7	65.8	15
26	29.90	29.71	29.803	84.5	3 P	61.0	12 P	72.7	74.5	65.2	7
27	30.03	29.83	29.942	73.0	4 P	51.5	12 P	62.3	61.8	51.5	14
28	30.07	29.98	30.023	76.0	5 P	44.5	6 A	60.5	61.7	56.0	12
29	29.99	29.77	29.864	74.5	7 P	60.5	5 A	67.5	67.5	67.0	0
30	29.80	29.67	29.739	87.5	2 P	67.0	5 A	77.3	75.0	72.0	6
31	30.16	29.80	30.018	70.0	1:30 P	53.0	12 P	61.5	64.7	57.7	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	68.3	.898	83.3	S.S.E.	103	3.0	24	1:30 P	4 A	5 A	,10	
2	60.7	1.048	54.3	W.S.W.	261	7.5	39	12 M				
3	62.0	.864	65.0	W.	101	1.5	17	10 A				
4	53.0	.796	55.7	N.N.W.	71	0.0	—	—				
5	59.0	.746	70.3	S.S.E.	108	1.0	14	6 P*	9 P	12 P	T.	
6	65.3	.788	82.0	S.S.E.	125	0.0	—	—	0 A	10 A	.45	
7	59.3	.826	67.7	N.N.W.	66	0.5	10	1:30 P				
8	59.0	1.085	53.3	N.E.	88	0.5	10	11 A				
9	66.7	1.095	65.7	N.W.	32	0.0	—	—				
10	69.7	1.063	72.7	S.S.W.	58	0.0	—	—	3 P	4:30 P	0.2	
11	62.0	.911	64.0	S.	57	0.5	10	2 P				
12	62.7	.925	66.7	S.S.E.	57	1.0	14	2 P	4:30 P	12 P	.05	
13	57.0	.661	72.7	N.N.W.	19	0.0	—	—	0 A	4 A	.03	
14	53.0	.751	69.7	S.	47	1.0	14	2 P	3:30 P	6 P	.26	
15	50.7	.486	77.7	S.W.	95	5.0	32	1 P	1 P	10 P	.06	
16	52.7	.610	67.0	W,N.W.	100	1.5	17	4 P	12:30 P	1 P	.01	
17	53.3	.728	61.3	S.S.E.	67	1.0	14	3 P				
18	58.7	.554	91.0	S.E.	85	4.0	28	3 P	1 P	12 P	.39	
19	59.7	.587	87.7	N..N.W.	194	1.5	17	4 P	0 A	5 P	.16	
20	61.0	.630	87.3	S.S.E.	77	1.0	14	7 P	6:30 P	8 P	.08	
21	61.7	.631	88.7	N.N.E.	56	0.5	10	1 P	4:30 A	11 A	.60	
22	65.0	.781	82.3	S.E.	110	3.0	24	2:30 P	4 P	10 P	.48	
23	62.3	.750	80.0	S.	50	1.0	14	5 P				
24	54.3	.746	63.0	N.N.W.	127	5.0	32	3 P				
25	62.0	.880	69.0	S.W.	84	2.0	20	3 P				
26	58.7	.885	57.3	W.N.W.	140	3.5	26	2 P				
27	41.3	.565	48.7	W.N,W.	218	4.5	30	11 A				
28	51.0	.602	68.3	S.	60	0.5	10	4 P				
29	65.7	.700	91.7	S.S.E.	191	15.5	56	7:30 P	1 P	11 P	1.93	
30	70.0	.930	81.3	S.S.E.	200	5.0	32	2 P	2 P	5 P	.02	
31	53.0	.601	68.0	W.N.W.	140	1.5	17	8 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

During July the weather was generally seasonable, and the departures from the normals of the various weather elements was in most cases small and unimportant. Thunder storms were more frequent than usual and the precipitation with them was large. The storm on the 29th was unusually heavy at this station. The total precipitation on that date was nearly two inches and about three-fourths of it fell in an hour and a half.

The mean barometer was about one-tenth of an inch below the normal, giving a mean record lower than any previous July at this station. The range was about five-sixths of the usual amount. The total wind movement was a little less than the normal, and but two gales were noted.

The mean temperature was nearly a degree below the normal and the range was slightly more than the average. The maximum temperature was high but a low relative humidity during the warmest period made it less oppressive than usual. The mean dew point and relative humidity were both slightly above the normal.

The total precipitation was about eight-tenths of an inch less than the normal—about two-thirds of it falling the last third of the month. The amount of cloudiness was nearly normal.

The growing crops have made good progress during the month. In this vicinity the hay crop harvested has been above the average and was very much better than expected. The tobacco is topping out very low. Corn is still very backward and a poor crop is expected.

J. E. OSTRANDER Meteorologist

F. F. HENSHAW Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 176. AUGUST, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing. 30.13, 2d, 8 A.
Minimum reduced to freezing, 29.37, 20th, 3 P., 22d, 4 P.
Reduced† maximum reading, 30.42, 2d, 8 A.
Reduced† minimum reading, 29.65, 20th, 3 P., 22d, 4 P.
Mean tri-daily reduced, ... 29.995
Monthly range, ...77

****Air Temperature.*** In Degrees Fahr.

Highest, ... 84.5, 22d, 2 P.
Lowest, ... 42.5, 8th, 5:30 A.
Mean hourly, ... 62.0
Mean of means of max. and min., ... 62.4
Mean sensible (wet bulb), ... 58.1
Monthly range, ... 42.0
Highest mean daily, ... 72.5, 22d
Lowestmean daily, ... 55.0, 29th
Mean maximum, ... 73.2
Mean minimum, ... 51.5
Mean daily range, ... 21.7
Greatest daily range, ... 35.5, 14th, 16th
Least daily range, ... 4.5, 5th

Humidity.

Mean dew point, ... 54.7
Mean force of vapor, ...593
Mean relative humidity, ... 78.2

Precipitation. In inches.

Total precipitation, ... 4.92
Number of days on which .01 inch or more rain or melted snow fell, ... 12

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 2105 m.
Greatest daily movement, ... 194m., 19th.
Least daily movement, ... 4m., 27th.
Mean daily movement, ... 68m.
Mean hourly velocity, ... 2.8 m.
Maximum pressure per square foot, 3.0 lbs.= 24 m. per hour, 23d, 1 P., W.
Prevailing Direction, West.

Summary.

South Southeast,	16 per cent.
Northwest,	13 " "
North,	10 " "
West,	13 " "
West Southwest,	13 " "
South,	13 " "
Other directions,	22 " "

Weather.

Mean cloudiness observed, ... 63 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 260 hrs.=61 per cent.
Number of clear days, ... 7
Number of fair days, ... 9
Number of cloudy days, ... 14

Bright Sunshine.

Number of hours recorded, . . . 169 hrs.=39%

Rain, 3d, 4th, 5th, 6th, 7th, 9th, 11th, 16th, 19th, 20th, 25th, 28th, 29th, 30th, 31st.

Gales, 35 miles or more per hour, none.

Thunder and Lightning, 25th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.32	30.16	30.256	77.0	4 P	46.5	5 A	61.7	61.8	56.5	13
2	30 42	30.32	30.367	80.5	5 P	47.0	6 A	63.7	64.0	56.5	12
3	30.36	30.25	30.305	74.5	2:30 P	52.0	5:30 A	63.3	62.5	58.2	4
4	30.26	30.04	30.141	66.0	11 A	55.5	6 A	60.7	58.5	56.7	0
5	30.04	29.96	29.990	59.0	1 P	54.5	6 A	56.7	56.5	55.7	0
6	29.99	29.79	29.914	65.0	2 P	54.5	6 A	59.7	59.5	59.2	0
7	29.97	29.78	29.845	74.0	2:30 P	50.0	12 P	62.0	64.2	56.8	10
8	30.03	29.97	29.992	69.5	1 P	42.5	5:30 A	56.0	57.5	53.0	7
9	29.97	29.81	29.868	63.5	5 P	49.0	5:30 A	56.3	58.4	58.2	2
10	29.99	29.85	29.955	78.0	1 P	54.0	12 P	66.0	66.2	61.2	6
11	29.99	29.79	29.876	77.0	2 P	48.0	5 A	62.5	63.6	60.7	7
12	29 98	29.78	29.887	74.0	2:30 P	56.0	12 P	65.0	64.5	58.7	7
13	30.13	29.98	30.073	72.0	4:30 P	43.0	6 A	59.0	59.2	54.7	8
14	30.16	30.02	30.087	78.5	4 P	45.5	5:30 A	60.7	60.5	55.0	11
15	30.12	30.03	30.092	81.0	4 P	49.5	5 A	63.3	62.1	57.2	10
16	30.09	30.00	30.040	73.0	2 P	49.5	5:30 A	61.3	59.7	58.0	1
17	30.02	29.93	29.991	80 0	4 P	47.5	6 A	64.7	62.5	57.2	8
18	30.08	29.98	30.030	78.5	4:30 P	62.0	5:30 A	63.0	63.3	58.8	8
19	30.01	29.81	29.918	78.0	3:30 P	62.0	5:30 A	70.0	68.8	65.8	0
20	29.81	29.65	29.706	76.0	5 P	53.0	11 P	69.0	68 3	64.7	3
21	29.95	29.79	29.922	80 5	2:30 P	60.5	5:30 A	66.7	66 3	60.2	13
22	29.90	29.65	29.720	84 5	2 P	56.5	5 A	70.5	72.5	64.8	4
23	29.88	29.72	29.793	83.0	3 P	56.0	12 P	69.5	70 7	60.3	11
24	29.97	29.87	29.934	80.5	4 P	48.0	5:30 A	64.3	64 0	58.3	13
25	29.98	29.76	29.847	70 0	2 P	51.5	5 A	60.7	56.2	58.0	3
26	30.02	29.84	29.961	68.5	6 P	56.0	6 A	62.3	60.9	58.0	3
27	30.07	30.02	30.052	75.0	1 P	50 0	6 A	62.5	60.4	56.5	6
28	30.13	30.07	30.086	67.5	2:30 P	53.0	6 A	60.3	58.3	55 3	0
29	30.14	30.12	30.132	60.5	3:30 P	52.0	6 A	56.3	55.0	54.7	0
30	30.12	30.05	3 0.097	60.5	12 M	54.0	0 A	57 3	56 7	55 2	0
31	30.05	29.90	29.961	64 0	3 P	52.0.	6 A	58.0	57.9	56.2	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	52.0	.590	71.7	N.W.	27	0.0	—	—				
2	51.3	.626	67.7	N.	30	0.5	10	1 P				
3	54.0	.615	71.0	N.N.E.	37	0.5	10	7 P	6 P	12 P	.02	
4	55.0	.499	88.0	E.	60	1.5	17	7 P	0 A	12 P	.69	
5	54.7	.458	94.0	E.N.E	91	1.0	14	12 M	0 A	6:30 P	1.05	
6	58.0	.539	90.3	S.S.E.	95	1.0	14	7 P	3 P	12 P	.07	
7	51.0	.606	66.3	W.	147	2.0	20	6 P	0 A	6 A	.06	
8	48.7	.500	70.3	S.S.E.	70	1.5	17	4 P				
9	57.0	.511	93.7	S.S.E.	43	0.0	—	—	12 M	7 P	T.	
10	58.3	.656	80.0	S.	32	0.5	10	2 P				
11	58.0	.655	77.7	S.S.E.	83	1.5	17	2:30 P	9 P	11 P	0.2	
12	55.0	.613	73.7	W.S.W.	91	2.0	20	6 P				
13	51.0	.528	73.3	W.S.W.	71	0.5	10	12 M				
14	50.0	.581	71.3	S.	25	0.0	—	--				
15	53.7	.591	75.0	N.N.W.	9	0.0	—	—				
16	55.7	.573	82.3	N.W.	7	0.0	—	—	3:30 P	6 P	T.	
17	53.7	.600	75.7	W.N.W.	22	0.5	10	11 A				
18	54.3	.640	74.3	S.S.W.	61	0.0	—	—				
19	63.3	.733	82.3	S.	194	1.5	17	6 P	10 A	12 P	.09	
20	62.3	.700	84.0	W.	61	0.5	10	5 A	0 A	10:30 A	.12	
21	55.3	.694	71.3	W.	67	0.5	10	12 M				
22	59.0	.898	58.3	S.	191	1.5	17	2 A				
23	51.7	.803	51.7	W.S.W.	113	3.0	24	1 P				
24	54.0	.646	71.7	S.W.	35	1.0	14	4 P				
25	56.3	.516	92.3	W.	49	0.5	10	4 P	5:30 A	7 P	1.09	
26	56.0	.539	85.3	N.W.	43	0.0	—	—				
27	54.0	.544	82.3	N.W.	4	0.0	—	—				
28	52.0	.514	78.3	S.S.E.	37	0.0	—	—	3 P	12 P	.08	
29	53 7	.443	94.0	N.E.	70	0.0	—	—	0 A	12 P	1 04	
30	54.0	.461	90.3	N.N.E.	136	0.0	—	—	0 A	12 P	.59	
31	54.0	.504	85.0	N.N.W.	105	0.0	—	—	0 A	9 A	T.	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather for the month was characterized by rather large departures from the normals of a number of the weather elements, the most noticeable being those of temperature. The large amount of cloudiness and small wind movement were also abnormal features.

A comparison of the records for the month with our previous August records shows the unusual features most satisfactorily.

The mean barometer was nearly normal and no marked periods of fluctuation were noted. The range was about twenty per cent more than usual. The total wind movement was about seventy per cent of the normal and the smallest for August excepting the record of 1894. No gales were noted and the daily movement on a number of dates was exceptionally small.

The mean temperature was more than six degrees below the normal and nearly four degrees lower than last year's record which was the lowest August mean previously noted here. The maximum for the month was less than any former August maximum at this station. The maximum was about normal and the range about six degrees less than usual. The mean dew point was about six degrees below the normal and the relative humidity unusually high.

The total precipitation was about twenty per cent more than usual, most of it falling during the storms of the 4th-5th and 28th-30th.

Corn has made fair progress during the month but is still so backward that at the best the crop will be poor. Tobacco is a fair crop and the plants are in fine condition. The apple crop is fair for the off year; other fall fruits are scarce.

J. E. OSTRANDER Meteorologist.

F. F. HENSHAW Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 177. SEPTEMBER, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 20th, 7 A.	30.12, 19th, 8 A.
Minimum reduced to freezing,	29.35, 17th, 4 P.
Reduced† maximum reading, 20th, 7 A.	30.42, 19th, 8 A.,
Reduced† minimum reading,	29.64, 17th, 4 P.
Mean tri-daily reduced,	30.095
Monthly range,	.78

****Air Temperature.*** In Degrees Fahr.

Highest,	91.0, 14th, 4 P.
Lowest,	30.5, 30th, 6 A.
Mean hourly,	61.3
Mean of means of max. and min.,	61.9
Mean sensible (wet bulb),	56.6
Monthly range,	60.5
Highest mean daily,	78.4, 14th
Lowestmean daily,	45.5, 29th
Mean maximum,	75.2
Mean minimum,	48.5
Mean daily range,	26.7
Greatest daily range,	39.0, 30th
Least daily range,	14.5, 27th

Humidity.

Mean dew point,	52.5
Mean force of vapor,	.600
Mean relative humidity,	75.0

Precipitation. In inches.

Total precipitation,	1.66
Number of days on which .01 inch or more rain or melted snow fell,	3

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	2890 m.
Greatest daily movement,	321m., 17th.
Least daily movement,	18m., 1st, 19th.
Mean daily movement,	96m.
Mean hourly velocity,	4m.
Maximum pressure per square foot, 30 m. per hour, 17th, 2 P., S.S.E.	7.5 lbs.=
Prevailing Direction, Southwest.	

Summary.

West.	30 per cent.
Northwest,	13 " "
South,	13 " "
South Southeast,	13 " "
Southwest,	10 " "
Other directions,	21 " "

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	137 hrs.=37 per cent.
Number of clear days,	15
Number of fair days,	8
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, . . . 236 hrs.=63%

Rain, 16th, 17th, 27th, 28th.

Gales, 35 miles or more per hour, 39m. 17th, S.S.E.

Thunder and Lightning, 5th, 17th, 27th.

Frost, 25th, 30th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.02	29.94	29.973	80.0	3 P	58.5	6 A	69.3	67.9	63.5	10
2	30.11	30.02	30.086	80.5	3:30 P	59.0	6 A	69.7	67.9	64.5	6
3	30.14	30.07	30.107	83.0	4:30 P	59.0	6:30 A	71.0	68.1	63.8	11
4	30.13	29.98	30.036	83.0	4 P	61.5	6:30 A	72.3	69.0	67.0	5
5	29.98	29.81	29.890	84.0	1 P	61.0	12 P	72.5	69.7	66.5	3
6	30.10	29.89	30.020	72.0	4 P	47.0	12 P	59.5	60.3	52.0	10
7	30.27	30.10	30.172	71.0	1 P	41.5	6 A	56.3	54.7	48.7	7
8	30.38	30.26	30.326	71.5	3:30 P	39.0	6 A	55.3	54.3	47.5	13
9	30.41	30.21	30.320	66.0	2 P	39 5	6 A	52.7	53.9	50.8	1
10	30.21	30.00	30.089	75.0	2:30 P	57.5	1 A	66.3	66.4	64.7	0
11	30.20	29.99	30.097	82.5	3 P	56.0	12 P	69.3	70.7	63.7	8
12	30.30	30.20	30.250	82.5	4 P	47.0	6 A	64.7	63.3	57.7	12
13	30.23	30.03	30.123	87.0	3 P	54.0	6 A	70.5	70.1	67.0	12
14	30.10	30.02	30.063	91.0	4 P	60.0	3 A	75.5	78.4	72.0	10
15	30.14	30.05	30.101	87.5	3 P	63.0	5 A	75.3	74.5	68.7	12
16	30.16	29.67	29.959	78.0	2:30 P	62.0	6 A	70.0	70.4	68.7	2
17	29.91	29.64	29.771	79.5	1 P	63.0	12 P	71.3	71.3	68.3	0
18	30.30	29.80	30.094	68.6	3 P	46.0	12 P	57.0	59.4	49.8	6
19	30.42	30.30	30.385	70.0	4 P	37.0	6 A	53.5	52.5	47.2	12
20	30.42	30.28	30.354	69.0	2 P	42.5	6 A	55.7	53.7	49.5	10
21	30.28	30.08	30.138	74.5	5 P	40.0	6:30 A	57.3	53.7	48.7	6
22	30.13	30.08	30.110	81.5	3 P	45.5	6 A	63.5	60.3	54.2	12
23	30.13	29.77	29.958	79.0	2 P	43 0	6:30 A	61.0	61.0	56.8	12
24	29.95	29.69	29.759	66.0	3 P	39.0	12 P	52.5	56.5	49.7	6
25	30.10	29.94	30.021	65.5	2 P	33.0	6 A	49.3	47.9	44.2	12
26	30.20	30.07	30.132	73.5	3 P	36.0	6:30 A	54.7	55.5	51.2	11
27	30.10	29.81	29.908	69.5	5 P	55.0	2:30 A	62.3	61.3	60.5	0
28	30.18	29.89	30.042	60.0	1 P	45.0	12 P	52.5	51.7	46.8	6
29	30.34	30.17	30.264	56.5	4 P	36.0	12 P	46.3	45.5	41.0	10
30	30.40	30.27	30.331	69.5	3:30 P	30.5	6 A	50.0	49.7	44.7	11

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	60.7	.710	79.0	W.	18	0.0	—	—				
2	62.0	.724	82.0	W.	22	0.0	—	—				
3	60.7	.743	77.7	S.W.	45	0.0	—	—				
4	65.3	.767	85.7	S.	160	1.0	14	6 P				
5	63.7	.778	80.0	N.N.W.	75	0.5	10	6 P				
6	44.0	.542	58.3	N.W.	153	4.0	28	9 A				
7	43.7	.432	73.0	W.	29	0.0	—	—				
8	40.0	.452	66.0	N.W.	29	0.0	—	—				
9	46.3	.468	72.0	S.S.E.	71	1.0	14	2 P				
10	62.7	.691	84.3	.S.E.	188	2.0	20	2 P				
11	60.0	.750	76.3	W.	96	0.5	10	3 P				
12	52.8	.658	71.7	W.	39	0.5	10	8 P				
13	65.0	.797	81.0	S.S.E.	116	1.0	14	1 P				
14	69.3	1.011	74.3	S.S.W.	104	0.0	—	—				
15	66.0	.908	75.7	S.	126	1.0	14	1 P				
16	67.7	.762	90.7	E.	154	5.0	32	6 P	10:30A	8 P	.68	
17	66.7	.776	85.7	S.	321	7.5	39	2 P	7 A	10 P	.31	
18	41.3	.496	56.7	N.W.	134	1.0	14	4 P				
19	41.0	.436	71.3	W.	18	0.0	—	—				
20	44.3	.456	73.3	N.	65	0.5	10	1 P				
21	44.0	.443	74.3	W.	52	1.0	14	11 A				
22	49.7	.589	70.7	W.	25	0.0	—	—				
23	52.7	.624	76.0	S.S.E.	99	1.0	14	4 P				
24	43.3	.466	64.3	N.W.	154	1.0	14	2 P				
25	40.3	.360	78.3	S.W.	43	0.5	10	3 P				
26	47.0	.508	73.7	S.E.	103	2.0	20	3 P				
27	60.3	.553	95.3	S.	166	2.0	20	4 P	7:30 A	8 P	.64	
28	41.3	.394	67.7	S.W.	109	5.0	32	1:30 P	1 P	11 P	T.	
29	34.7	.315	69.3	W.	108	1.5	17	2 P				
30	38 0	.418	67.0	S.S.E.	68	0.5	10	12 M				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather for September was especially marked by the large number of clear or fair days, and the small precipitation. Ffteen days were recorded as clear and eight as fair and but three were overcast. On but three days was a measurable amount of precipitation noted. A high percentage of sunshine and rather small wind movement were other noticeable features. The absence of frosts until near the end of the month was favorable to vegetation, especially the corn crop, but much of it did not ripen even with the favorable weather.

The rowen crop was good and secured in good condition and the tobacco all harvested without injury from frost.

A comparison of the records with those of previous years shows the following as the more important features.

The mean barometer was slightly higher than the normal and the range slightly less than usual. The mean temperature was nearly normal and the range unusually large due to a high maximum and low minimum. The mean temperature was nearly as high as the mean for last month.

The relative humidity and mean dew point were both less than usual.

The total precipitation was about four-tenths of the normal and less than any previous record for September at this station. The total wind movement was about ninety per cent. of the normal, and but one gale was noted.

J. E. OSTRANDER Meteorologist.

F. F. HENSHAW. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 178. OCTOBER, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.11, 3d, 11 A.
Minimum reduced to freezing,	29.03, 18th, 1 A.
Reduced† maximum reading,	30.40, 3d, 11 A.
Reduced† minimum reading,	29.32, 18th, 1 A.
Mean tri-daily reduced,	30.000
Monthly range,	1.08

****Air Temperature.*** In Degrees Fahr.

Highest,	77.5, 1st, 2 P.
Lowest,	22.5, 29th, 6:30 A.
Mean hourly,	51.1
Mean of means of max. and min.,	51.4
Mean sensible (wet bulb),	47.2
Monthly range,	55.0
Highest mean daily,	64.5, 2d
Lowest mean daily,	33.1, 27th
Mean maximum,	61.7
Mean minimum,	41.1
Mean daily range,	20.6
Greatest daily range,	41.0, 29th
Least daily range,	3.5, 11th

Humidity.

Mean dew point,	39.2
Mean force of vapor,	.410
Mean relative humidity,	74.5

Precipitation. In inches.

Total precipitation,	2.72
Number of days on which .01 inch or more rain or melted snow fell,	14
Snow, total in inches,	trace

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4703 m.
Greatest daily movement,	348m., 9th.
Least daily movement,	25m., 6th.
Mean daily movement,	152m.
Mean hourly velocity,	6.3m.
Maximum pressure per square foot, 8.0 lbs.= 40 m. per hour, 26th, 2 P., W.S.W.	
Prevailing Direction, West, Southwest.	

Summary.

South,	19 per cent.
West,	16 " "
North, Northwest,	16 " "
South Southeast,	10 " "
Other directions,	39 " "

Weather.

Mean cloudiness observed,	58 per cent.
Total cloudiness recorded by the Sun Thermometer,	187 hrs.=55 per cent.
Number of clear days,	11
Number of fair days,	5
Number of cloudy days,	15

Bright Sunshine.

Number of hours recorded,	154 hrs.=45%

Rain, 1st, 2d, 4th, 5th, 7th, 8th, 9th, 10th, 11th, 12th, 16th, 17th, 18th, 19th, 23d.

Snow, 26th, 28th.

Gales, 35 miles or more per hour, 40m. 26th, W.S.W.

Killing Frost, 22d.

Heavy Frosts, 15th, 22d, 25th, 29th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine
	Maximum.	Minimum.	Mean Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.27	30.00	30.085	77.5	2 P	42.0	6:30 A	59.7	59.7	56.2	2
2	30 32	30.03	30.144	73.0	3 P	56.0	12 P	64.5	64.5	59.3	4
3	30.40	30.28	30.334	70.0	2:30 P	44.0	6 A	57.0	55.7	48.2	11
4	30.33	30.11	30.219	68.0	2 P	36.5	6:30 A	52.3	54.6	52.5	5
5	30.14	30.06	30.083	68.0	12 M	56.0	12 P	62.0	62.0	60.8	0
6	30.24	30.12	30.187	75.0	2 P	47.0	6:30 A	61.0	58.8	55.0	8
7	30.27	30.10	30.193	63.0	3 P	51.5	6:30 A	57.3	57.0	54.5	0
8	30.10	29.77	29.862	70.5	1:30 P	54.0	4 A	62.3	61.8	60.3	1
9	29.98	29.74	29.855	62.0	12 M	55.0	12 P	58.5	58.6	56.0	0
10	30.08	29.98	30.069	56.5	9 A	50.0	6:30 A	53.3	52.8	48.7	2
11	30.06	29.88	29 987	52.0	12 M	48.5	5:30 A	50.3	50.5	48.7	0
12	29.90	29 77	29.827	56.5	1 P	49.5	6:30 A	53.0	52.6	50.8	0
13	29.95	29.88	29.917	66.5	2 P	45.0	12 P	55.7	56.0	50.8	6
14	29.95	29.80	28.880	69.5	1:30 P	36.0	6:30 A	52.7	52.0	46.7	11
15	30.08	29.95	30.033	64.0	3:30 P	34.0	6:30 A	49.0	49.4	43.8	10
16	30.07	29.91	29.981	67.5	3 P	47.5	2 A	57.5	57.1	55.5	1
17	29.93	29.37	29.718	65.5	1 P	57.0	12 P	61.3	59.6	59.0	0
18	29.96	29.32	29.645	58.0	1 A	42.0	12 P	50.0	51.0	44.3	5
19	30.07	29.96	30.020	50.5	3 P	33.0	6 A	41.7	42.3	40.5	0
20	29.96	29.73	29.822	70.5	1 P	44.0	1 A	57.3	54.6	49.0	11
21	30.27	29 91	30.105	59 0	3 P	35 0	12 P	47.0	46.3	40.2	10
22	30.36	29.99	30.196	59.0	1 P	27.0	6:30 A	43.0	44.7	42.2	7
23	29 99	29.87	29.909	56.5	9 A	42 0	12 P	49.3	48 7	48.7	0
24	30.03	29.95	30.007	48.5	12 M	27.0	12 P	37.7	39.6	35.5	3
25	29.99	29 65	29.810	53.0	3 P	23.5	7 A	38.3	36.5	34 0	10
26	29.97	29.59	29 792	42.0	4 A	32.0	12 P	37.0	37.6	32.7	4
27	30.12	29.97	30.086	40 0	1:30 P	26.0	12 P	33 0	33.1	27.8	5
28	30.12	30.01	30.066	46.0	3 P	26.0	0 A	36.0	33.8	30 2	10
29	30.12	29.92	30.000	63.5	2:30 P	22.5	6:30 A	43.0	43.5	39 7	10
30	30.12	29.95	30.063	69.0	4 P	41.0	6:30 A	55.0	54.6	48.0	8
31	30.18	30.05	30.119	71.0	2:30 P	45.0	5 A	58.0	54.8	45 5	10

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	52.7	.602	74.7	S.S.E.	101	1.0	14	2 P	8:30 P	12 P	.02	
2	55.3	.598	77.7	N.N.E.	124	3.0	24	11 A	0 A	7:30 A	.05	
3	41.7	.454	67.7	E.N.E.	88	0.0	—	—				
4	49.7	.480	82.3	S.	122	2.5	22	12 P	9 P	11 P	.19	
5	59.7	.559	93.0	S.	148	1.0	14	6 A	11:30A	8 P	.22	
6	50.3	.565	72.7	S.W.	25	0.5	10	8 P				
7	51.7	.474	82.0	E.N.E.	49	0.0	—	—	7:30 P	12 P	.09	
8	59.3	.509	86.7	E.S.E.	217	3.5	26	4 P	0 A	12 P	.23	
9	54 7	.486	87.7	N.E.	348	4.5	30	8 A	0 A	8 P	.25	
10	44.7	.394	76.0	N.	292	4.0	28	8 A	2 P	7 P	T.	
11	46 7	.365	89.0	N.N.W.	280	4.0	28	3 A	11 A	8 P	.26	
12	48.3	.402	84.7	N.N.W.	300	3.5	26	9 A	3 A	7 P	.17	
13	44 7	.481	64.0	N.N.W.	283	3.0	24	8 A				
14	41.0	.431	68.3	W.N.W.	64	2.0	20	1:30 P				
15	37.0	.385	68.3	S.	78	0 0	—	—				
16	52.7	.512	80.0	S.S.E.	147	1.0	14	6 P	8 A	9 A	.01	
17	58.0	.520	94.3	S.S.E.	130	1.0	14	5 P	6:30 A	12 P	.72	
18	37.0	.362	64.3	W.	206	5.5	33	3 P	0 A	7 A	.11	
19	37.3	.278	86.7	S.	107	0.5	10	11 P	9 A	1 P	.06	
20	43.3	.460	68.7	S.	245	3.0	24	11 A				
21	32.7	.324	72.3	N.W.	63	3.5	26	12 M				
22	37.3	.342	74.3	S.	125	5.0	32	3 P				
23	47.7	.357	94.3	WN.W.	128	1.0	14	10 A	7 A	9 P	.34	
24	30.7	.243	72.3	N.N.W.	123	1.0	14	1 P				
25	27.0	.248	71.3	N.N.W.	48	0.5	10	1 P				
26	27.7	.223	69.3	W.	311	8.0	40	2 P	8 A	3 P		T.
27	16.3	.188	51.0	W.	251	5.5	33	11 A				
28	22.3	.206	68.7	W.	89	1.5	17	2 A	3 A	5 A		T.
29	32.7	.350	64.7	S.W.	81	3.0	24	4 P				
30	40 7	.451	61.3	W.	61	0.0	—	—				
31	33.0	.469	48.0	S.S.W.	69	0.5	10	8 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during October was seasonable and the departures from the normals for the month generally small. The period from the 8th to the 13th was marked by a large wind movement for this locality, a scattered precipitation and but little sunshine. The last week of the month was unusually cold excepting the last two days. on the 27th and 28th the mean hourly temperature was almost to the freezing point. On the mornings of the 27th and 29th thin ice was formed in shallow places. No heavy frost was noted before the middle of the month.

A comparison of the records with those of previous years shows the following features: The mean barometer was slightly below the normal and the range about the usual amount. While the fluctuations of pressure were mostly small the chart record was more unsteady than usual.

The mean temperature was about one degree above the normal while the maximum and minimum were the same amount lower than usual. On the 29th a rise of 41 degrees in 8 hours occurred. The mean due point was three degrees below the normal and the relative humidity slightly higher than the normal.

The total precipitation was about two-thirds the usual amount and fairly well distributed throughout the month. On the 26th there were slight snow flurries and on the 28th a light snow before morning.

The total wind movement was about 20 per cent more than usual yet but one gale of more than 35 miles per hour was recorded on the pressure chart.

J. E. OSTRANDER. Meteorologist.

F. F. HENSHAW. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 179. NOVEMBER, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.38, 21st, 10 A.
Minimum reduced to freezing,	29.08, 5th, 1 P.
Reduced† maximum reading,	30.70, 21st, 10 A.
Reduced† minimum reading,	29.38, 5th, 1 P.
Mean tri-daily reduced,	30.009
Monthly range,	1.32

Air Temperature. In Degrees Fahr.

Highest,	74.5, 4th, 3:30 P.
Lowest,	6.0 27th, 6:30 A.
Mean hourly,	34.3
Mean of means of max. and min.,	35.1
Mean sensible (wet bulb),	31.3
Monthly range,	68.5
Highest mean daily,	52.9, 4th
Lowestmean daily,	15.1, 27th
Mean maximum,	45.7
Mean minimum,	24.5
Mean daily range,	21.2
Greatest daily range,	39.0, 4th
Least daily range,	6.5, 16th

Humidity.

Mean dew point,	25.6
Mean force of vapor,	.231
Mean relative humidity,	73.5

Precipitation. In inches.

Total precipitation,	2.04
Number of days on which .01 inch or more rain or melted snow fell,	5
Snow, total in inches,	trace

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3362 m.
Greatest daily movement,	320m., 7th
Least daily movement,	5m., 22d
Mean daily movement,	112m.
Mean hourly velocity,	4.7m.
Maximum pressure per square foot,	9.5 lbs.= 44 m. per hour, 24th, 12 M., W.N.W.
Prevailing Direction,	West. Northwest.

Summary.

West. Northwest,	30 per cent.
North, Northwest,	20 " "
West,	10 " "
Southwest,	10 " "
Other directions,	30 " "

Weather.

Mean cloudiness observed,	41 per cent.
Total cloudiness recorded by the Sun Thermometer,	111 hrs.=38 per cent.
Number of clear days,	15
Number of fair days,	5
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded, . . . 182 hrs.=62%

Rain, 5th, 12th, 16th, 17th, 22d, 23d.

Snow, 6th, 15th. 16th. 22d, 23d.

Gales, 35 miles or more per hour, 44m. 24th, W.N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.13	30.04	30.085	62.0	1:30 P	39.0	12 P	50.5	50.7	44.2	10
2	30.14	30.04	30.087	65.0	2:30 P	32.0	6:30 A	48.5	47.3	42.5	10
3	30.08	29.97	30.016	71.5	3 P	37.0	7 A	54.3	51.3	45.3	10
4	30.00	29.77	29.877	74.5	3:30 P	35.5	7 A	55.0	52.9	48.2	10
5	29.77	29.38	29.546	62.5	3 P	36.0	12 P	49.3	48.2	46.5	2
6	29.98	29.71	29.887	39.5	12 M	30.0	12 P	34.7	34.0	31.5	1
7	30.10	29.98	30.043	40.5	3 P	28.0	4 A	34.3	33.0	28.7	6
8	30.22	30.10	30.183	51.0	2 P	27.0	5 A	39.0	38.1	33.5	7
9	30.25	30.06	30.142	63.0	3 P	28.0	7 A	45.5	42.9	38.2	10
10	30.06	29.80	29.910	59.0	3 P	32.0	7 A	45.5	43.6	39.7	7
11	30.01	29.83	29.915	61.0	2 P	27.5	7 A	44.3	41.0	38.2	10
12	29.98	29.81	29.888	55.0	3 P	30.0	12 P	42.5	41.7	36.3	9
13	30.05	29.87	29.944	58.5	2:30 P	27.5	7 A	43.0	41.2	36.2	9
14	30.08	29.95	30.008	50.0	2 P	32.0	12 P	41.0	40.3	35.3	3
15	30.18	30.03	30.129	43.0	11 A	30.5	4 A	36.7	36.0	32.7	3
16	30.18	29.92	30.022	36.0	0 A	29.5	7 A	32.7	33.3	31.8	0
17	29.92	29.73	29.807	41.0	10 P	34.0	0 A	37.5	37.5	37.5	0
18	30.12	29.89	30.014	41.5	3 P	24.0	12 P	32.7	34.4	29.5	3
19	30.45	30.12	30.318	35.0	1 P	21.5	3 A	28.3	27.3	24.5	5
20	30.68	30.45	30.618	37.0	3 P	16.5	7 A	26.7	25.6	23.0	9
21	30.70	30.50	30.610	36.5	4 P	13.0	6:30 A	24.7	21.9	20.7	9
22	30.50	30.11	30.248	32.0	1:30 P	15.0	1 A	23.5	26.8	26.3	0
23	30.11	29.58	29.827	38.5	10 P	24.5	7 A	31.5	32.3	31.8	0
24	29.82	29.54	29.675	39.5	--	28.0	12 P	33.7	35.3	30.5	1
25	30.06	29.82	29.987	27.5	12 M	13.0	12 P	20.3	22.1	18.8	9
26	30.07	30.00	30.047	30.5	1 P	7.0	6:30 A	18.7	16.5	16.7	9
27	30.12	29.95	30.024	25.5	1 P	6.0	6:30 A	15.7	15.1	15.8	8
28	29.95	29.71	29.766	31.0	3 P	12.0	12 P	21.5	20.5	19.3	9
29	29.79	29.65	29.716	25.5	3 P	6.5	6 A	16.0	15.5	16.0	4
30	30.12	29.75	29.923	36.5	3:30 P	14.0	7:30 A	25.3	22.7	21.3	9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	36.3	.385	64.7	W.N.W.	150	3.5	26	1:30 P				
2	36.3	.363	70.0	S.W.	61	1.5	17	1 P				
3	38.0	.431	63.7	S.W.	28	0.0	—	—				
4	41.7	.474	66.0	S.S.W.	27	0.0	—	—				
5	42.7	.377	7.77	W.	164	3.0	24	6 P	6 A	11 A	.26	
6	26.3	.197	74.7	N.N.W.	300	3.5	26	5 P	12 M	12 P		T.
7	18.3	.193	57.3	W.N.W.	320	5.0	32	9 A				
8	24.3	.247	57.3	W.N.W.	99	3.5	26	9 A				
9	32.3	.336	71.7	S.	101	0.5	10	4 P				
10	34.0	.315	70.0	S.	198	2.5	22	3 P				
11	32.7	.305	72.0	N.N.E.	45	0.5	10	3 P				
12	28.3	.278	66.0	W.N.W.	97	2.5	22	9 A	5 A		T.	
13	26.3	.304	58.7	S.W.	86	2.5	22	2 P				
14	28.3	.250	67.7	N.W.	58	0.5	10	7 P				
15	24.7	.221	61.7	W.	181	3.0	24	11 A	7:30 A	10 A		T.
16	29.7	.184	93.0	N.E.	75	0.5	10	5 P	10 A	12 P	.77	
17	36.7	.228	97.0	N.N.W.	83	0.0	—	—	0 A	11 P	.90	
18	22.7	.189	69.0	W.N.W.	119	3.0	24	6 P				
19	18.0	.151	69.0	W.N.W.	90	2.5	22	11 A				
20	14.3	.149	64.0	N.N.W.	42	0.0	—	—				
21	18.0	.125	84.7	W.N.W.	31	0.0	—	—				
22	25.0	.148	94.7	W.	5	0.0	—	—	9 A	9 P	.01	T.
23	31.0	.186	95.3	S.S.E.	72	1.5	17	4 P	2 P	12 P	.10	T.
24	19.3	.207	55.3	W.N.W.	278	9.5	44	12 M				
25	13.7	.114	78.3	W.N.W.	164	3.0	24	11 A				
26	13.7	.105	86.0	N.N.W.	20	0.5	10	2 P				
27	11.7	.101	81.0	N.	176	4.5	30	8 P				
28	15.0	.119	80.0	N.N.W.	188	1.5	17	7 A				
29	12.7	.101	84.0	N.N.W.	172	1.0	14	4 P				
30	16 0	.135	74.7	N.	32	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

November proved to be a more pleasant month than usual for the time of year. The more important departures from the normals were of an agreeable rather than a disappointing nature. A small precipitation, large amount of clear weather and low temperature were the more prominent characteristics. The large amount of wind from the Northwest quadrant was also a prominent feature.

Comparing the records for the month with the normals of this station the following features are noted: The mean barometer was slightly lower than the normal and the range was a little larger than usual. The fluctuations of pressure were generally slow and of considerable range. The total wind movement was about 80 per cent of the normal and on but one date was the pressure recorded large enough to indicate a gale.

The mean temperature was about three degrees lower than the normal; the last third of the month being unusually cold. The maximum for the month was about ten degrees higher and minimum about five degrees lower than the usual November records. The range was nearly fifteen degrees more than the average and one of the largest for any month during the past fifteen years. Owing to the loss of the Draper chart containing the hourly temperatures from the 21st to the 24th inclusive, the mean tri-daily records for those dates have been used in computing the mean hourly temperature.

The total precipitation was but little more than one half the usual amount, nearly all of it falling during the storm of the 16th-17th. Snow occurred on several dates but not in measurable amounts. At the close of the month the ice on the ponds in this locality was several inches thick.

J. E. OSTRANDER Meteorologist

F. F. HENSHAW Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 180. DECEMBER, 1903.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.27, 19th, 10 A.
Minimum reduced to freezing, 28.73, 10th, 3 A.
Reduced† maximum reading, 30.60, 19th, 10 A.
Reduced† minimum reading, 29.04, 10th, 3 A.
Mean tri-daily reduced, ... 29.967
Monthly range, ... 1.56

****Air Temperature.*** In Degrees Fahr.

Highest, ... 52.0, 20th, 7 P.
Lowest, ... —9.5, 27th, 6 A.
Mean hourly, ... 22.5
Mean of means of max. and min., ... 22.1
Mean sensible (wet bulb), ... 21.1
Monthly range, ... 61.5
Highest mean daily, ... 35.8, 21st
Lowest mean daily, ... 5.5, 27th, 29th
Mean maximum, ... 31.4
Mean minimum, ... 12.9
Mean daily range, ... 18.5
Greatest daily range, ... 38.0, 20th
Least daily range, ... 7.5, 3d

Humidity.

Mean dew point, ... 16.1
Mean force of vapor, ...135
Mean relative humidity, ... 76.5

Precipitation. In inches.

Total precipitation, ... 3.95
Number of days on which .01 inch or more rain or melted snow fell, ... 8
Snow, total in inches, ... 12
Snow on ground at end of month, . . 4 inches

Wind.

Total movement, ... 4994 m.
Greatest daily movement, ... 316m., 13th
Least daily movement, ... 7m., 1st
Mean daily movement, ... 161m.
Mean hourly velocity, ... 6.7m.
Maximum pressure per square foot, 17.0 lbs.= 58 m. per hour, 13th, 12 M., W.
Prevailing Direction, West, Southwest.

Summary.

West, ... 23 per cent.
North, ... 19 " "
South, ... 16 " "
Southwest, ... 13 " "
Other directions, ... 29 " "

Weather.

Mean cloudiness observed, ... 49 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 154 hrs.=54 per cent.
Number of clear days, ... 9
Number of fair days, ... 7
Number of cloudy days, ... 15

Bright Sunshine.

Number of hours recorded, . . . 129 hrs.=46%
Rain, 9th, 13th, 20th, 24th.
Snow, 2nd, 3rd, 5th. 9th, 13th, 20th, 22nd, 26th, 27th, 29th, 31st.
Gales, 35 miles or more per hour, 58m. 13th, W.; 46 m. 20th, S.; 40 m. 21st, W.N.W.; 51 m. 22nd, W.N.W.; 39 m. 24th, S.; 47 m. 28th, W.N.W.
Days of sleighing, ... 3

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Tri-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.32	30.12	30.290	35.5	2:30 P	8.0	7 A	21.7	19.0	18.2	9
2	30 32	30.15	30.213	32.0	8 P	14.0	2 A	23.0	25.1	25.7	0
3	30.15	30.01	30.043	32.0	2 P	24.5	6 A	28.3	27.2	26.8	1
4	30.09	30.00	30.035	39.5	12 M	11.0	12 P	25.3	27.4	24.7	6
5	30.12	30.01	30.052	30.0	8 P	7.0	2 A	18.5	19.2	20.8	0
6	30.07	29.70	30.003	33.5	2:30 P	12.5	7:30 A	23.0	25.2	24.2	3
7	30.04	29.85	29.925	34.5	2:30 P	19.5	7 A	27.0	27.3	25.2	4
8	30.06	29.93	30.019	36.5	2:30 P	23.0	3 A	29.7	28.7	28.0	0
9	30.04	29.09	29.670	35.0	6 P	23.0	3 A	29.0	29.3	29.3	0
10	29.70	29.04	29.439	35.5	9 A	26.0	12 P	30.7	31.3	28.5	2
11	30.11	29.70	29.963	34.5	3 P	16.0	8 A	25.3	24.5	22.2	9
12	30.39	30.08	30.270	39.0	12 P	16.0	7 A	27.5	25.6	23.3	8
13	30.16	29.64	29.905	47.0	11 A	21.0	12 P	34.0	35.0	30.3	3
14	30.31	30.16	30.270	23.0	1 P	14.0	7:30 A	18.5	18.3	15.0	9
15	30.26	30.06	30.144	21.5	1 P	12.5	7 A	17.0	15.9	14.5	2
16	30.06	29.79	29.871	27.5	2:30 P	11.5	7 A	19.5	18.3	18.0	9
17	30.04	29.89	29.972	27.0	6:30 P	6.5	7 A	16.7	18.8	16.5	5
18	30.55	30.04	30.369	17.0	3 P	4.0	12 P	10.5	10.9	7.0	9
19	30.60	30.27	30.467	23.0	4 P	0.0	7 A	11.5	10.8	9.7	4
20	30.27	29.20	29.583	52.0	7 P	14.0	0 A	33.0	35 4	38.0	0
21	29.75	29 27	28.632	40.0	0 A	30.5	6 P	35.3	35.8	30.8	7
22	30.06	29 56	29.779	36.0	10:30 A	19.0	12 P	27.5	29 0	25.0	4
23	30 17	30 04	30.087	36.5	3 P	16.0	6 A	26.3	25 7	24.8	9
24	30.11	29 67	29.915	42.0	5 P	28.0	4 A	35.0	35.0	32.8	2
25	29.67	29 50	29.539	40.0	3 P	27.0	12 P	33.5	34.5	31.8	0
26	29 94	29.44	29.631	25.0	7 A	−3.0	12 P	11.0	14.9	12.8	0
27	29.94	29.62	29.729	17.0	10 P	−9.5	6 A	3.7	5.5	7.8	2
28	30.28	29.66	30.084	20.0	2 A	2.0	12 P	11.0	11.7	8.7	9
29	30.31	30.02	30.165	12.0	12 P	−2.5	6 A	4.7	5.5	6.3	0
30	30.02	29.91	29.961	24.0	4 P	−2.0	8 A	11.0	10.5	10.1	9
31	30.01	29.92	29.949	24.0	3 P	9.0	2 A	16.5	17.0	17.2	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	15.7	.117	86.3	W.	7	0.0	—	—				
2	22.0	.151	83.0	N.	171	2.0	20	9 P	9 A	12 P	*	*
3	24.3	.154	87.3	N.	310	2.5	22	2 P	0 A	1 P	.61	6
4	19.3	.156	76.0	N.	155	2.0	20	6 P				
5	17.0	.122	85.7	N.N.E.	15	0.0	—	—	11 A	1 P		T.
6	22.0	.113	88.3	S.W.	103	1.0	14	1 P				
7	21.0	.151	79.3	S.	157	1.0	14	2 P				
8	23.3	.169	76.3	S.E.	33	0.0	—	—				
9	27.7	.168	91.0	N.	117	1.5	17	10 P	4 P	12 P	.98	½
10	23.0	.175	74.7	W.	218	5.0	32	6 A				
11	14.3	.141	66.7	W.	80	0.0	—	—				
12	16.3	.146	68.7	S.	162	1.5	17	1 P				
13	23.0	.198	64.0	S.W.	316	17.0	58	12 M	4 A	12 M	.54	T.
14	7.7	.099	65.7	W.	271	5.5	33	3 P				
15	7.3	.095	68.3	W.	150	1.5	17	4 P				
16	10.3	.110	65.3	S.W.	191	4 5	30	8 P				
17	9.0	.111	66.0	W.	190	5.0	32	1 P				
18	−4.7	.070	57.3	N.	160	4.5	30	11 A				
19	3.7	.080	73.0	N.W.	11	0.0	—	—				
20	37.0	.256	92.7	S.	194	10.5	46	2:30 P	3 A	7 P	1.42	T.
21	23.0	.204	60.7	W.S.W.	291	8.0	40	12 M				
22	20.7	.152	77.0	S.W.	286	13.0	51	3 P	4 A	12:30 P		T.
23	18.0	.159	68.0	S.	158	2.5	22	2 A				
24	28.0	.211	75.0	S.S.E.	240	7.5	39	5 P	3 P	7 P	.03	
25	27.3	.199	77.7	S.	169	1.5	17	1 A				
26	7.7	.092	77.0	N.W.	180	5.0	32	1 P	5 A	1 P	.14	2½
27	6.3	.067	91.0	S.S.W.	161	1.0	14	1 P	10 A	3 P	.04	½
28	2.3	.073	71.7	W.N.W.	235	11 0	47	10 A				
29	5.0	.063	92.3	N.	75	0.0	—	—	9 A	8 P	.19	2½
30	8.7	.082	89.3	W.	64	0.5	10	5 P				
31	12.0	.106	75.3	S.S.E.	124	1.0	14	4 P	9 A	10 A		T.

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1903.

Pressure. In inches.

Maximum reduced to freezing, ... 30.38, Nov. 21st, 10 A.
Minimum reduced to freezing, ... 28.61, Feb. 17th, 3 A.
Maximum reduced to freezing and sea-level, ... 30.70, Nov. 21st, 10 A.
Minimum reduced to freezing and sea-level, ... 28.93, Feb. 17th, 3 A.
Mean reduced to freezing and sea-level, ... 29.996
Annual range, ... 1.77

****Air Temperature.*** In degrees Fahr.

Highest, ... 97.0, July 9th, 4 P.
Lowest, ... —12.0, Jan. 20th, 9 A.
Mean, ... 46.7
Mean of means of max. and min., ... 47.0
Mean sensible (wet bulb), ... 43.0
Annual range, ... 109°
Highest mean daily, ... 79.6, July 9th.
Lowest mean daily, ... —3.0, Jan. 19th.
Mean maximum, ... 57.8
Mean minimum, ... 36.1
Mean daily range, ... 21.7
Greatest daily range, 45.0, Feb. 21st. Mar. 14th., May 12th.
Least daily range, . . . 3.5 June 15th., Oct. 11th.

Humidity.

Mean dew point, ... 37.6
Mean force of vapor, ...403
Mean relative humidity, ... 73.5

Wind.

Prevailing direction, ... West Southwest.

Summary.

West, ... 14 per cent.
North, Northwest, ... 10 " "
South, Southwest, ... 12 " "
West, Northwest, ... 9 " "
South, ... 9 " "
Other directions, ... 46 " "
Total movement, ... 46256 m.
Greatest daily movement, . . . 402 m., Apr. 17th.
Least daily movement, ... 4 m., Aug. 27th.
Mean daily movement, ... 126.7 m.
Mean hourly velocity, ... 5.28 m.

*Temperature in ground shelter.

F. F. HENSHAW,
Observer.

Maximum pressure per square foot, 22.0 lbs.=66 m. per hour, Feb. 12th, 12 M. W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 45.45
Number of days on which .01 or more rain or melted snow fell, ... 116
Snow total in inches, ... 33.5

Weather.

Mean cloudiness observed, ... 53 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2328 hrs.=52 per cent.
Number of clear days, ... 119
Number of fair days, ... 98
Number of cloudy days, ... 148

Bright Sunshine.

Number of hours recorded, 2126 hrs.=48 per cent.

Dates of Frosts.

Last, ... May 2d.
First, ... Sept. 25th.

Dates of Snow.

Last, ... Apr. 4th.
First, ... Oct. 26th.
Total days of sleighing, ... 52

Gales of 50 or More Miles Per Hour

Jan. 50 m., 31st, W.
Feb. 56 m., 9th, S.W.; 66 m, 12th, W., 58 m. 28th, S.S.W.
Apr. 50 m., 18th, W.S.W.
July 56 m., 29th, S.W.
Dec. 58 m., 13th, W., 51 m. 22nd, W.N.W.

J. E. OSTRANDER,
Meteorologist.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 181. JANUARY, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.56, 19th, 9 A.
Minimum reduced to freezing, 29.09, 9th, 2 P., 14th, 1 P.
Reduced† maximum reading, 30.90, 19th, 9 A.
Reduced† minimum reading, 29.40, 9th, 2 P., 14th, 1 P.
Mean semi-daily reduced, ... 30.083
Monthly range, ... 1.50

****Air Temperature.*** In Degrees Fahr.

Highest, ... 40.0, 23d, 3 P.
Lowest, ... —26.0, 5th, 7:30 A.
Mean hourly, ... 14.3
Mean of means of max. and min., ... 14.3
Mean sensible (wet bulb), ... 12.0
Monthly range, ... 66.0
Highest mean daily, ... 33.3, 23d
Lowest mean daily, ... —12.7, 15th
Mean maximum, ... 23.7
Mean minimum, ... 4.9
Mean daily range, ... 18.8
Greatest daily range, ... 32.5, 11th
Least daily range, ... 6.5, 14th, 18th

Humidity.

Mean dew point, ... 9.3
Mean force of vapor, ...093
Mean relative humidity, ... 85.5

Precipitation. In inches.

Total precipitation, ... 4.74
Number of days on which .01 inch or more rain or melted snow fell, ... 12
Snow, total in inches, ... 23½
Snow on ground at end of month, . 13 inches

Wind.

Total movement, ... 4112 m.
Greatest daily movement, ... 315m., 3d
Least daily movement, ... 0m., 7th
Mean daily movement, ... 133m.
Mean hourly velocity, ... 5.5m.
Maximum pressure per square foot, 11.0 lbs.= 47 m. per hour, 17th, 5 A., W.
Prevailing Direction, North, Northwest.

Summary.

North, ... 29 per cent.
Northwest, ... 19 " "
North, Northwest, ... 13 " "
South, ... 10 " "
Other directions, ... 32 " "

Weather.

Mean cloudiness observed, ... 55 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 150 hrs.=51 per cent.
Number of clear days, ... 12
Number of fair days, ... 5
Number of cloudy days, ... 14

Bright Sunshine.

Number of hours recorded, . . . 144 hrs.=49%

Rain, 13th, 22d, 23d.

Snow, 2nd, 3rd, 7th. 8th, 9th, 13th, 16th, 20th, 21st, 22d, 23d, 26th, 29th.

Lightning, ... 22d

Gales, 35 miles or more per hour, 44m. 3d, N.; 35 m. 4th, N.W.; 37 m. 14th, W.S.W.; 47 m. 17th, W.; 43 m. 25th, W.

Days of sleighing, ... 31

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.09	29.84	29.990	32.0	3 P	12.0	12 P	22.0	21.8	16.5	8
2	30 17	29.73	29.995	12.0	0 A	−1.0	10 A	5.5	1.1	0.0	0
3	30.13	29.73	29.962	2.0	3 P	−8.0	12 P	−3.0	−1.2	−3.5	7
4	30.52	30.10	30.414	−1.0	3 P	−16.0	12 P	−8.5	−6.8	−8.3	9
5	30.60	30.47	30.545	6.0	4 P	−26.0	7:30 A	−10.0	−12.7	−16.5	9
6	30.47	30.09	30.254	5.5	8 P	−21.5	7 A	−8.0	−6.8	−7.0	3
7	30.09	29.93	29.998	26.0	4 P	0.0	3 A	13.0	10.6	9.0	5
8	29.93	29.52	29 733	25.0	12 P	3.0	3 A	14.0	14.5	15.5	0
9	29.54	29.40	29.533	34.5	2 P	23.0	9 A	28.7	27.4	27.7	2
10	29.89	29 54	29.756	30.0	1 P	11.0	12 P	20.5	24.3	19.5	6
11	30.07	29.89	30.065	30.5	3 P	−2.0	9 A	14.3	14.0	8.3	9
12	30.24	30.07	30.203	29.5	4 P	18.5	7 A	24.0	23.4	21.3	0
13	30.24	29.42	29.797	39.0	8:30 P	25.0	0 A	32.0	31.4	32.0	0
14	29.59	29.40	29.489	34.0	1:30 P	27.5	9 A	30.7	30.8	27.0	5
15	30.15	29.59	29.938	28.0	0 A	8.0	12 P	18.0	19.8	15.0	8
16	30.15	29.57	29.843	27.0	12 P	2.0	4 A	14.5	13.9	14.0	0
17	30.26	29.57	30.004	32.5	1 A	3.0	12 P	17.7	18.7	14.0	9
18	30.75	30.26	30.538	10.5	3 P	4.0	7:30 A	7.3	1.6	−0.7	9
19	30.90	30.64	30.749	10.0	4 P	−9.0	7:30 A	0.5	−2.0	−6.0	9
20	30.64	30.13	30.292	23.0	8:30 A	−7.0	0 A	8.0	11.9	13.5	0
21	30.20	30.10	30.173	28.0	3 P	14.5	5 A	21.3	21.8	21.3	0
22	30.19	29.76	29.965	27.0	12 P	19.5	4 P	23.3	21.7	22.0	0
23	29 88	29.77	29.836	40.0	3 P	27.0	0 A	33.5	33 3	33.5	0
24	30 05	29 83	29.956	35.0	4 P	14.0	12 P	24.5	29.7	25.0	3
25	30.45	30 02	30.407	19.5	3 P	4.0	12 P	11.7	10.7	6.0	10
26	30 48	29.84	30.161	17.5	3 P	−1.0	7 A	8.3	8.3	7.7	2
27	30.44	29.83	30.175	20.0	12 M	4.0	11 P	12.0	13.0	8.7	10
28	30.61	30.42	30.520	20.0	3 P	−10.0	7:30 A	5.0	7.7	2.7	6
29	30.42	30.10	30.217	23.5	4 P	14.0	7 A	18.7	17.7	15.5	0
30	30.21	30.09	30.162	36 0	3 P	6.5	7:30 A	21.3	19.7	12.0	10
31	30.16	29.77	29.988	33 5	5 P	13.0	1 A	23.3	26.1	26.3	5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	11.5	.103	75.0	W.	115	1.0	14	2 P				
2	−2.5	.046	85.5	N.N.W.	256	3.0	24	7 P	8 A	12 P	*	*
3	−6.0	.039	87.0	N.N.W.	315	9.5	44	9 A	0 A	9 A	.80	4
4	−10.5	.031	89.5	N.W.	234	6.0	35	6 P				
5	−17.5	.021	95.5	N.W.	9	0.0	—	—				
6	−9.5	.038	86.0	N.E.	2	0.0	—	—				
7	8.5	.069	98.0	N.	0	0.0	—	—	6 A	10 A		T.
8	14.0	.098	91.0	N.	9	0.0	—	—	12:30 P	12 P	*	*
9	25.5	.154	89.5	N.	109	1.0	14	8 P	0 A	2:30 P	.62	4
10	15.0	.119	77.0	W.N.W.	193	5.0	32	2 P				
11	7.0	.073	92.5	N.	33	0.0	—	—				
12	18.5	.123	82.0	N.	201	3.5	26	1 P				
13	29.0	.192	85.5	N.E.	106	2.0	20	11 P	10 A	10 P	.87	1
14	22.5	.161	76.0	W.S.W.	230	7.0	37	2 P				
15	12.0	.099	78.5	N.W.	228	3 5	26	1 P				
16	11.5	.090	89.0	S.W.	12	0.0	—	—	2:30 P	8 P	.13	1
17	11.5	.094	83.5	N.W.	289	11.0	47	5 A				
18	−3.5	.044	84.5	N.	191	4.5	30	1 P				
19	−10.0	.035	78.0	N.N.W.	192	2.5	22	7 A				
20	11.5	.090	87.5	S.	72	0.5	10	12 M	6:30 A	11 P	.10	1½
21	19.5	.118	89.5	N.	57	0.0	—	—	7:30 A	12 P	*	*
22	20.5	.123	93.5	N.N.W.	169	0.0	—	—	0 A	12 P	*	*
23	32.0	.196	93.5	E.	22	0.0	—	—	0 A	8 A	1.56	5½
24	22.0	.149	79.5	W.N.W	128	5.5	33	12 M				
25	−1.0	.065	67.5	W.S.W.	216	9.0	43	2 P				
26	5.0	.067	89.0	N.	55	1.5	17	7 P	2 P	11 P	.52	5
27	4.5	.073	77.0	N.W.	163	3.5	26	2 P				
28	−0.5	.061	83.5	S.	56	0.0	—	—				
29	13.0	.095	84.5	N.	130	0.0	—	—	7:30 A	11 P	.14	1½
30	9.5	.082	88.0	S.E.	65	0.5	10	9 P				
31	25.0	.149	94.0	S.	255	3.0	24	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather for the month will be long remembered on account of the unusually low temperature that prevailed. On the 4th the maximum was one degree below zero, and on the 5th the minimum fell to 26.5 degrees below zero, while the mean hourly record for the day was 12.7 degrees below zero. On five days the mean hourly temperature was below zero, and on but one day was it above the freezing point. On ten days the minimum fell below zero, while on but eight days did the maximum rise above freezing. The mean for the month was more than nine degrees below the normal.

The mean barometer was slightly above the normal; the fluctuations were generally large and of considerable duration.

The mean relative humidity was nearly ten per cent above the normal and the mean dew point ten degrees below the normal. The total precipitation was about one-third more than usual, much of it occurring as snow. Other departures from normals were unimportant.

On January 1st the times of observation were changed from 7 A. M., 2 P. M. and 9 P. M., to 8 A. M. and 8 P. M. The mean barometer, mean sensible temperature, dew point, force of vapor, relative humidity and cloudiness observed are now computed from two readings per day instead of from three readings as heretofore.

J. E. OSTRANDER. Meteorologist.

F. F. HENSHAW. Observer.

ERRATUM: Bulletin No. 180. Total annual precipitation should read 44.45.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 182. FEBRUARY, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.34, 21st, 7 A.
Minimum reduced to freezing,	29.00, 1st, 1 P.
Reduced† maximum reading,	30.67, 21st, 8 A.
Reduced† minimum reading,	29.31, 1st, 1 P.
Mean semi-daily reduced,	30.114
Monthly range,	1.36

Air Temperature. In Degrees Fahr.

Highest,	48.0, 7th, 11 P.
Lowest,	—8.0, 10th, 7 A.
Mean hourly,	17.7
Mean of means of max. and min.,	17.3
Mean sensible (wet bulb),	14.5
Monthly range,	56.0
Highest mean daily,	36.5, 22d
Lowest mean daily,	1.3, 16th
Mean maximum,	27.8
Mean minimum,	6.8
Mean daily range,	21.0
Greatest daily range,	43.5, 21st
Least daily range,	7.0, 19th,

Humidity.

Mean dew point,	9.5
Mean force of vapor,	.104
Mean relative humidity,	77.7

Precipitation. In inches.

Total precipitation,	2.45
Number of days on which .01 inch or more rain or melted snow fell,	11
Snow, total in inches,	10
Snow on ground at end of month,	8 inches

Wind.

Total movement,	4910 m.
Greatest daily movement,	343m., 25th
Least daily movement,	6m., 6th
Mean daily movement,	169m.
Mean hourly velocity,	7.0m.

Maximum pressure per square foot, 23.5 lbs.= 69 m. per hour, 8th, 2 A., W.N.W.

Prevailing Direction, West, Northwest.

Summary.

Northwest,	31 per cent.
North, Northwest,	17 " "
West,	14 " "
North,	10 " "
Southwest,	10 " "
Other directions,	18 " "

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	134 hrs.=44 per cent.
Number of clear days,	16
Number of fair days,	4
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, 173 hrs.=56%

Rain, 6th, 7th, 21st, 22d, 28th.

Hail, 28th.

Snow, 1st, 5th, 6th, 12th, 14th, 15th, 19th, 23d, 24th, 28th,, 29th.

Gales, 35 miles or more per hour, 41m. 1st, W.; 39m. 3d, N.W.; 69m. 8th, W.N.W.; 39m. 16th, W.N.W.; 46m. 22d, W.; 40m. 25th, W.N.W.

Days of sleighing, 29

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.83	29.31	29.513	33.0	1 P	5.0	12 P	19.0	24.7	21.5	0
2	30.18	29.76	30.007	16.5	3 P	−2.0	7:30 A	7.3	8.2	7.3	5
3	30.17	29.76	30.080	19.5	3 P	8.0	11 P	13.7	16.0	10.5	8
4	30.27	30.12	30.229	15.5	4:30 P	0 5	6 A	8.0	8.8	3.7	8
5	30.24	30.09	30.186	20.0	4 P	5 0	0 A	12.5	12.3	10.0	9
6	30.19	29.79	29.913	25.0	12 P	5.0	4 A.	15.0	16.1	17.5	0
7	29.80	29.34	29.510	48.0	11 P	23.0	3 A	35.5	34.8	35.5	4
8	30.32	29.53	30.073	45.0	0 A	4.0	12 P	24.5	17.0	8.5	10
9	30.44	30.32	30.398	10.0	4 P	−3.0	7 A	3.5	3.0	0.3	10
10	30.48	30.33	30.429	24.0	3 P	−8.0	7 A	8.0	7.6	2.3	10
11	30.44	30.32	30.406	23.5	4 P	−3.5	7 A	10.0	9.1	4.5	7
12	30.38	30.28	30.363	23.5	5 P	−4.5	7 A	9.5	10.0	6.0	10
13	30.40	30.30	30.378	33.5	3:30 P	13.0	3 A	23.3	23.1	20.7	7
14	30.35	29.82	30.113	28.5	3 P	19.5	7:30 A	24.0	24.5	21.3	1
15	29.82	29.65	29.723	26.0	1 P	4.0	12 P	15.0	19.8	16.0	5
16	29 94	29.78	29.846	5.5	2:30 P	−4.5	7 A	0.5	1.3	0.0	8
17	30.27	29.94	30.148	16.0	4 P	0.0	3 A	8.0	6.0	2.7	10
18	30 43	30.27	30.391	25.0	4 P	−2.0	7 A	11.5	12.5	9.5	8
19	30 35	30.12	30.218	22.0	3 P	15.0	12 P	18.5	18.0	16.0	0
20	30.65	30.27	30.542	37.0	5 P	7.0	7 A	22.0	19.7	13.0	11
21	30.67	30.06	30.479	38 0	4 P	−5.5	7 A	16.3	19.9	16.5	10
22	30.06	29.52	29.658	45.5	5 A	25 0	12 P	35.3	36.5	35.3	0
23	29 97	29.69	29.827	38 0	3 P	20.0	7 A	29.0	29 7	26.3	3
24	29.69	29.49	29.605	37.5	2:30 P	19 0	12 P	28 3	30.6	27.0	2
25	30.22	29 69	29.974	19.0	0 A	6 0	12 P	12.5	11.6	7.7	8
26	30.34	30.22	30.317	27.5	3 P	3 5	7 A	15 5	13 5	9.7	10
27	30.57	30.34	30.529	30.0	3 P	8.5	7 A	19 3	18.7	15.3	9
28	30.55	30.05	30.210	35.0	8 P	15.5	0 A	25.0	27.7	29.0	0
29	30.33	30.10	30.245	38.5	6 A	24.0	12 P	31.3	32.1	27.8	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	21.0	.126	96.5	N.W.	136	8.5	41	9 P	12 M			T
2	5.0	.068	86.5	W.	241	3.0	24	6 A				
3	−4.5	.083	46.0	N.W.	195	7.5	39	9 A				
4	−2.5	.057	72.5	S.W.	136	3 0	24	12 M				
5	7.5	.078	84.5	W.	178	3.0	24	12 M	11 P	12 P	*	*
6	16.5	.105	94.0	N.W.	6	0 0	—	—	0 A	1 P	.37	3
7	34.0	.222	93.5	S.S.E.	138	3.5	26	10 A	12 M	1 P	.09	
8	−2.5	.075	54.5	N.W.	310	23.5	69	2 A				
9	−6.0	.048	70.5	N.W.	174	4.0	28	1 P				
10	−5.5	.057	68.0	N.N.W.	106	2.5	22	2 P				
11	1.5	.058	85.5	N.	105	2.0	20	2 A				
12	4 0	.063	89.5	N.N.W.	111	3.0	24	10 P	9 P			T.
13	16.5	.125	77.5	N.	212	4.0	28	9 A				
14	18.5	.122	86.5	E.S.E.	151	2.0	20	1 P	1 P	12 P	*	*
15	8.0	.103	76.5	N.W.	225	5 5	33	11 P	0 A	9 A	.48	4
16	−5 0	.046	77.0	W.	336	7.5	39	3 P				
17	−3.5	.054	73 5	N.W.	290	4.5	30	11 A				
18	5.5	.077	81.5	N.W.	116	4.0	28	10 A				
19	11.5	.098	77.5	N.N.W.	19	1.5	17	10 P	4 A	6 P	.15	1½
20	9 5	.086	86.5	N.W.	111	0.0	—	—				
21	13 5	.128	84 0	S.S.E.	55	2.0	20	6 P	10 P	12 P	.08	
22	33.5	.217	92.0	S.W.	260	10.5	46	8 P	0 A	1 P	.65	
23	20.0	.165	68.5	S.W.	220	4.5	30	3 P	3 P			T.
24	22.5	.159	79.0	W.	120	5.0	32	5 P	3 A	5 P	.29	1½
25	0.0	.069	66.5	W.N.W	343	8.0	40	10 A				
26	3.0	.077	68.0	N.N.W.	99	0.5	10	11 A				
27	10.5	.098	75.0	N.N.W.	132	2 5	22	6 A				
28	27.0	.170	89.5	S.	182	5 0	32	2 P	12 M	4:30 P	.34	T.
29	18.0	.179	57.5	N.	194	6 0	34	6 A	12 M	12 P	*	*

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The extremely cold weather which prevailed during January continued with but little less severity throughout February. The mean temperature for December, which was several degrees below the normal, combined with the means of the last two months gives a record for the winter unprecedentedly low.

The temperature for the month shows a mean seven degrees below the normal. On eight dates the minimum was below zero; on every day the minimum fell below freezing; on only eleven days did the maximum go above the freezing point, and on but three dates was the mean hourly temperature above 32° Fahr.

The mean barometer was about one-tenth of an inch above the normal and the range was considerably less than usual. The total wind movement was hardly 90 per cent. of the normal and an unusually large amount of it come from the northwest quadrant.

The mean dew point was about ten degrees lower than usual, while the relatlve humidity was nearly normal. An unusually large number of clear days were noted.

The precipitation was nearly one inch less than the normal amount and fairly well distributed throughout the month. The total snowfall of 10 inches was not unusual. The sleighing has been good through out the month.

The month closed with eight inches of snow on the ground and a snow storm in progress.

J. E. OSTRANDER. Meteorologist

F. F. HENSHAW Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No 183. MARCH, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.63, 5th, 10 A.
Minimum reduced to freezing,	29.07, 3d, 5 P.
Reduced† maximum reading,	30.96, 5th, 10 A.
Reduced† minimum reading,	29.38, 3d, 5 P.
Mean semi-daily reduced,	30.106
Monthly range,	1.58

****Air Temperature.*** In Degrees Fahr.

Highest,	65.0, 26th, 12 ; 30 P.
Lowest,	—3.0, 5th, 7 A.
Mean hourly,	31.0
Mean of means of max. and min.,	30.8
Mean sensible (wet bulb),	27.5
Monthly range,	68.0
Highest mean daily,	47.6, 26th
Lowest mean daily,	11.2, 5th
Mean maximum,	39.9
Mean minimum,	21.7
Mean daily range,	18.2
Greatest daily range,	34.0, 26th
Least daily range,	3.5, 22th,

Humidity.

Mean dew point,	22.4
Mean force of vapor,	.175
Mean relative humidity,	74.4

Precipitation. In inches.

Total precipitation,	4.48
Number of days on which .01 inch or more rain or melted snow fell,	11
Snow, total in inches,	11
Snow on ground at end of month,	1 inch

Wind.

Total movement,	4444 m.
Greatest daily movement,	327m., 4th
Least daily movement,	41m., 5th
Mean daily movement,	143m.
Mean hourly velocity,	6.0m.
Maximum pressure per square foot, 14.5 lbs.= 54 m. per hour, 3d, 9 P., N.W.	
Prevailing Direction, West, Northwest.	

Summary.

Northwest,	23 per cent.
South,	16 " "
North,	13 " "
West,	13 " "
West, Northwest,	13 " "
Other directions,	22 " "

Weather.

Mean cloudiness observed,	57 per cent.
Total cloudiness recorded by the Sun Thermometer,	199 hrs.=54 per cent.
Number of clear days,	12
Number of fair days,	5
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded, 172 hrs.=46%

Rain, 3d, 6th, 7th, 8th, 22d, 23d, 25th.

Sleet, 31st.

Snow, 1st, 6th, 9th, 11th, 15th, 18th, 31st.

Gales. 35 miles or more per hour, 54m. 3d, N.W.; 37m., 4th, N.W.; 45m. 9th, W.; 40m. 11th, N.; 39m. 16th, N.W.; 35m. 20th, W.N.W.; 36m. 26th, S.W.

Days of sleighing, 19

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.31	30.17	30.236	33.5	3 P	22.5	3 A	28.0	28.2	27.0	0
2	30 32	30.09	30.248	40.0	4 P	28.0	6 A	34.0	32.1	29.0	6
3	30.09	29.38	29.730	41.0	3 P	19.0	12 P	30.0	31.4	28.7	0
4	30.71	29.88	30.450	20.0	4 P	4.0	12 P	12.0	13.0	9.3	11
5	30.96	30.71	30.896	24.5	3 P	−3.0	7 A	10.7	11.2	8.3	9
6	30.83	30.44	30.602	31.0	3 P	15.5	6 A	23.3	23.7	22.3	0
7	30.44	29.60	29.969	45.5	6 P	28.0	0 A	36.7	36.5	35.7	0
8	29.68	29.52	29.618	44.0	10 A	34.5	7 A	39.3	38.8	35.5	3
9	29.92	29.66	29.781	37.0	0 A	17 0	12 P	27.0	26.4	22.0	10
10	30.06	29.92	30.020	29.0	5 P	14.5	6:30 A	21.7	21.7	18.5	8
11	30.01	29.60	29.753	29 0	9 P	19.5	6:30 A	24.3	24.7	22.5	0
12	29.75	29.62	29.712	33.0	3 P	17.0	6 A	25.0	24.8	20.3	10
13	30.01	29.75	29.876	32.5	3 P	16.0	6:30 A	24.3	24.6	23.2	12
14	30.07	29.88	30.000	33.0	5 P	13.0	6 A	23.0	26.1	24.0	7
15	29.88	29 70	29.770	36.0	4 P	27.5	7 A	31.7	30.6	27.7	0
16	30.28	29 79	30 055	32.5	2 P	18.0	12 P	25.3	27.1	23.0	10
17	30.43	30.19	30.336	40.5	5 P	8.0	6:30 A	24.3	24.7	20.3	12
18	30.19	29.72	29.883	36.0	0 P	26.0	6 A	31.0	31.8	30.0	0
19	29.98	29.76	29 883	47.0	3 P	27.0	6 A	37.0	37.0	32.5	5
20	30.24	29.69	29.996	41.5	8 A	25.0	12 P	33.3	35.3	31.0	10
21	30.46	30.24	30.440	43 0	3 P	19.5	6 A	31.3	32.9	30.7	7
22	30.44	29 92	30.169	36.0	4 P	32.5	7 A	34.3	34 5	32.5	0
23	30 36	29.85	30.125	52.5	4 P	35.0	0 A	43.7	42.2	36.3	8
24	30.56	30.36	30.532	59.0	5 P	29.0	4 A	44 0	43.4	35.0	12
25	30.54	29.92	30.216	56.0	7:30 P	32.5	5 A	44.3	45.8	45.0	0
26	29.95	29.55	29.763	65.0	0:30 P	31.0	12 P	48.0	47.6	42.3	3
27	30.08	29.95	30 050	41.5	12:30 P	27.0	4 A	34 3	32.2	28.0	2
28	30.19	30 08	30.166	40.0	4:30 P	23.0	6 A	31.5	30.9	25.5	4
29	30.37	30.16	30.295	42.5	5 P	18.5	6 A	30.5	30.8	25.7	12
30	30 45	30.29	30.390	51.5	3 P	20.5	5 A	36 0	35.7	28.5	11
31	30.35	30 27	30.337	43.5	2 P	26.5	6 A	35.0	33 9	30.7	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	28.0	.153	92.0	N.	146	1.0	14	7 P	0 A	4 P	.86	7
2	27.0	.166	89.5	S.	53	3.0	24	9 P				
3	26.0	.169	83.5	S.	211	14.5	54	9 P	6 A	6 P	.79	
4	6.0	.073	82.5	N.W.	327	7.0	37	5 A				
5	4.5	.071	81.5	S.W.	41	1.0	14	9 P				
6	21.0	.124	92.0	W.N.W	52	0.0	—	—	5 A	8 P	.03	T.
7	35.0	.216	95.0	W.	105	3.5	26	5 P	10 A	12 P	1.86	
8	32.0	.228	79.0	N.W.	98	4.0	28	9 P	0 A	2 A	.06	
9	14.5	.138	64.0	W.N.W.	285	10.0	45	8 A	12 M			T.
10	11.5	.115	67.5	N.W.	240	2.5	22	1 P				
11	18.5	.135	64.0	N.	83	8.0	40	10 P	11 A	5 P		T.
12	13.5	.123	68.0	N.W.	295	5.5	33	3 A				
13	19.5	.134	81.5	N.N.W.	194	3.0	24	12 M				
14	17.0	.147	65.0	S.E.	68	0.5	10	8 A				
15	23.5	.164	79.0	N.	65	0.5	10	10 A	5 A	12 M	.07	$\frac{1}{2}$
16	13 5	.145	59.0	N.W.	255	7.5	39	8 P				
17	14.0	.127	68.5	S.S.E.	44	1.5	17	8 A				
18	27.0	.181	83.0	S.S.E.	156	1.5	17	8 A	2 A	4 P	.30	$2\frac{1}{2}$
19	27.5	.206	73.0	S.W.	181	4.0	28	6 P				
20	23.0	.207	61.5	W.	274	6.0	35	10 A				
21	26.5	.194	74.5	N.W.	60	1.0	14	11 A				
22	30.0	.194	86.0	S.	88	1.0	14	10 A	10 A	12 P	.11	
23	30.5	.241	74.5	N.	97	3.5	26	12 P	0 A	6 A	.09	
24	22.0	.282	42.0	W.	105	3.5	26	0 A				
25	43.0	.324	90.0	S.	207	4.5	30	12 P	1:30 P	5 P	.01	
26	38.5	.313	81.0	W.N.W.	315	6.5	36	12 M				
27	21.5	.173	68.5	W.	108	0.5	10	10 P				
28	15.5	.162	57.0	W.N.W.	65	2.0	20	8 P				
29	16.0	.165	55.5	N.W.	108	1.5	17	10 A				
30	21.0	.185	61.0	S.	61	2.0	20	5 P				
31	27.5	.180	87.0	N.E.	57	1.0	14	2 P	2 P	12 P	.30	1.0

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during March approached more closely normal conditions than any month since October last. Although the mean temperature was below the normal about three degrees, the departure was largely due to two cold days early in the month. The change from winter to spring while still incomplete made good progress. The breaking up of the ice in the Connecticut River took place near the close of the month and the resulting damage was much less than expected.

A comparison of the records with those of previous years shows these features of interest ; the mean barometer was nearly a tenth of an inch above the normal and the range was unusually large. The fluctuations were unusually large and of considerable duration, that of the period from the 3d to the 8th being the most pronounced. The total wind movement was about four-fifths the usual amount.

The range of temperature was about one-third greater than usual owing to a minimum nearly ten degrees below the mean of the March minimums, and an unusually high maximum. The mean dew point was over four degrees below the average, and the relative humidity about normal.

The total precipitation was about ten per cent. more than normal, most of it occurring early in the month. About one-third of the total occurred as snow.

Sleighing continued until the close of the 19th, making a record for the winter of eighty-two days without a break.

J. E. OSTRANDER Meteorologist

F. F. HENSHAW Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 184. APRIL, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.19, 23d, 8 A.
Minimum reduced to freezing,	29.20, 10th, 3 A.
Reduced† maximum reading,	30.50, 23d, 8 A.
Reduced† minimum reading,	29.50, 10th, 3 A.
Mean semi-daily reduced,	29.967
Monthly range,	1.00

****Air Temperature.*** In Degrees Fahr.

Highest,	70.5, 25th, 4 P.
Lowest,	20.0, 4th, 6 A.
Mean hourly,	42.5
Mean of means of max. and min.,	43.2
Mean sensible (wet bulb),	37.3
Monthly range,	50.5
Highest mean daily,	54.7, 30th
Lowest mean daily,	30.5, 14th
Mean maximum,	53.6
Mean minimum,	32.8
Mean daily range,	20.8
Greatest daily range,	38.0, 22d
Least daily range,	4.5, 9th

Humidity.

Mean dew point,	31.5
Mean force of vapor,	.267
Mean relative humidity,	70.8

Precipitation. In inches.

Total precipitation,	5.73
Number of days on which .01 inch or more rain or melted snow fell,	12
Snow, total in inches,	2

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4902 m.
Greatest daily movement,	360m., 3d
Least daily movement,	53m., 1st, 6th
Mean daily movement,	163m.
Mean hourly velocity,	6.8m.

Maximum pressure per square foot, 15.5 lbs.= 56 m. per hour, 2d, 11 A., N.E.

Prevailing Direction, West, Northwest.

Summary.

Northwest,	17 per cent.
North, Northwest,	13 " "
West,	13 " "
South,	10 " "
Other directions,	47 " "

Weather.

Mean cloudiness observed,	52 per cent.
Total cloudiness recorded by the Sun Thermometer,	220 hrs.=55 per cent.
Number of clear days,	10
Number of fair days,	7
Number of cloudy days,	13

Bright Sunshine.

Number of hours recorded, . . . 182 hrs.=45%

Rain, 1st, 2d, 7th, 9th, 10th, 12th, 15th, 19th, 20th, 25th, 26th, 27th, 28th, 29th, 30th.

Snow, 14th. 16th, 19th, 20th.

Gales, 35 miles or more per hour, 56m. 2d, N.E.; 36m. 3d, N.N.W.; 36m. 12th, W.; 36m. 14th, W.; 44m. 16th, N.; 41m. 21st, N.N.W.

Thunder and Lightning, ... 1st, 30th

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.32	29.78	30.015	37.0	3 P	32.0	0 A	34.5	34.7	34.3	0
2	29.78	29.70	29.722	50.0	11 A	35.0	0 A	42.5	43.4	38.7	4
3	30.23	29.78	30.002	39.5	3 P	28.0	12 P	33.7	33.8	26.7	4
4	30.35	30.19	30.274	51.5	4 P	20.0	6 A	35.7	36.6	29.0	11
5	30.20	30.10	30.174	61.0	3 P	31.0	5 A	46.0	46.0	35.7	13
6	30.18	30.03	30.121	62.5	4 P	27.0	6 A	44.7	47.1	38.3	6
7	30.12	29.97	30.026	60.0	4 P	36.0	7 A	48.0	45.3	40.0	6
8	30.22	30.06	30.154	66.0	4 P	30.5	6 A	48.3	49.3	42.5	7
9	30.06	29.55	29.825	46.5	12 M	42.0	12 P	44.3	43.8	42.7	0
10	29.65	29.50	29.600	60.0	3 P	40.0	12 P	50.0	48.5	42.7	4
11	29.89	29.64	29.752	52.0	2.30 P	35.5	6 A	43.7	42.5	38.7	2
12	29.89	29.57	29.689	58.0	3 P	38.0	7 A	48.0	44.8	39.7	3
13	29.93	29.78	29.890	42.5	2 P	26.0	12 P	34.3	35.5	28.7	6
14	30.04	29.93	29.987	40.0	3 P	23.0	5 A	31.5	30.5	26.7	8
15	30.13	29.85	30.038	48.0	4 P	25.0	6 A	36.5	36.0	32.7	9
16	30.12	29.57	29.787	41.0	4 30 P	28.0	12 P	34.5	33.5	29.7	7
17	30.21	30.09	30.156	48.0	5 P	25.0	6 A	36.5	36.0	29.0	13
18	30.11	29.87	29.969	56.5	4 P	30.0	6 A	43.3	42.5	36.3	10
19	29.87	29.69	29.793	52.5	12 M	28.0	12 P	40.3	38.5	33.3	3
20	29.87	29.64	29.731	40.0	5 P	24.0	6 A	32.0	32.0	29.3	3
21	30.32	29.87	30.118	55.0	3 P	33.0	12 P	44.0	43.9	34.7	13
22	30.46	30.32	30.422	62.5	6 P	24.5	6 A	43.5	44.0	35.7	13
23	30.50	30.31	30.423	63.5	4 P	27.5	6 A	45.5	44.6	38.3	9
24	30.36	29.93	30.143	65.0	3 P	32.5	6:30 A	48.7	47.8	39.3	10
25	29.93	29.64	29.733	70.5	4 P	45.0	4 A	57.7	53.1	46.5	7
26	30.04	29.73	29.885	64.5	2 P	44.0	5 A	54.3	52.3	45.0	8
27	30.15	30.04	30.131	47.0	0 A	41.0	12 P	44.0	44.0	41.7	0
28	30.12	29.92	29.996	47.5	6 P	41.0	0 A	44.3	43.5	43.3	0
29	29.92	29.71	29.776	52.5	4 P	44.5	3 A	48.5	47.7	47.0	0
30	29.76	29.63	29.695	67.5	12.30 P	47.5	6 A	57.5	54.7	52.7	3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	33 0	.200	95.0	N.E.	53	0.0	—	—	0 A	8 P	1.18	
2	34.0	.270	73.5	W.	221	15.5	56	11 A	1 P	7 P	T	
3	20.5	.173	64 0	N.W.	360	6.5	36	3 P				
4	18.5	.201	53.0	N.W.	140	2.5	22	1 P				
5	21.5	.292	39.5	N.W.	147	1.5	17	3 P				
6	28.0	.314	53.0	S.W.	53	1.0	14	11 P				
7	37.0	.276	82.5	E.	93	1.5	17	4 P	4 A	10 A	.21	
8	37.5	.326	73.0	S.E.	105	3.5	26	5 P				
9	42.5	.278	96.0	N.N.E.	97	1.0	14	7 A	0 A	12 P	1.34	
10	38.0	.316	73.5	S.W.	114	4.0	28	4 P	0 A	3 A	.02	
11	35.5	.261	81.0	W.S.W.	66	4.0	28	3 P				
12	35.0	.280	74.5	W.S.W.	178	6.5	36	7 P	4 A	7.30 A	.11	
13	19.0	.192	54.5	W.N.W.	223	4.5	30	3 P				
14	20.0	.164	71.5	W.	123	6.5	36	1 P	6 A	11 A		T.
15	27.0	.205	72.5	W.	113	4 0	28	11 A	5 P	12 P	T	
16	23 5	.183	73.0	N.W.	238	9.5	44	11 A	0 A	12 M	.45	2.
17	17.5	.199	50.5	W.	180	4.0	28	4 P				
18	35.5	.251	84.0	S.	167	3.5	26	12 M				
19	26.0	.230	63.5	N.W.	123	4.0	28	10 P	1 P	5.30 P	T	T.
20	26 5	.170	86.5	N.N.W.	260	3.5	26	3 P	12.30 P	9 P	.02	T.
21	19 5	.283	37.5	N.N W.	340	8.5	41	12 M				
22	25.0	.278	50.5	N.	72	0.5	10	9 A				
23	35.0	.255	78.5	S.	128	3.5	26	6 P				
24	29 5	.312	53.0	S.	240	4.5	30	2 P				
25	43.5	.357	79.0	W.N.W.	211	2.5	22	3 P	2 A	5 A	.11	
26	38.0	.381	59.5	N.N.W	187	4.5	30	11 A	8 P	12 P	T	
27	41.0	.276	92.5	N.N.E.	193	4.5	30	5 P	0 A	12 P	1.24	
28	42.5	.291	92.5	N.	284	4.5	30	2 A	0 A	12 P	.61	
29	45.0	.333	89.5	N.N.W.	158	1.5	17	5 A	0 A	9 P	.28	
30	50.0	.454	78.0	N.E.	55	1.0	14	2 P	12 M	3 P	.16	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during April was considerably cooler than usual, and the season which was backward when the month opened made less than the usual progress as the month advanced. When the month closed seasonable conditions were about two weeks backward. On half the days of the month the minimum temperature fell to the freezing point or below, and on the 20th thin ice was formed. The last frost of the month was noted on the morning of the 23d.

The mean barometer was slightly below the normal and the range rather small. The pressure was rather unsteady especially during the first half of the month. The total wind movement was slightly below the normal although a number of moderate gales were noted.

The mean temperature was about three degrees below the normal, and the lowest since 1898. The range was considerably less than usual, and the maximum was the lowest April maximum in ten years. The mean dew point was four degrees below the normal and the relative humidity five per cent higher than usual.

The total precipitation was twice the normal amount and well distributed throughout the month. A number of snow flurries occurred about the middle of the month. The percentage of cloudiness was slightly above the average.

Owing to the backwardness of the season spring operations on the farm have been delayed and but little has been done except plowing on high ground.

J. E. OSTRANDER Meteorologist.

F. F. HENSHAW Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No 185. MAY, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.07, 3d, 2 A
Minimum reduced to freezing,	29.33, 20th, 2 P.
Reduced† maximum reading,	30.37, 3d, 2 A.
Reduced† minimum reading,	29.62, 20th, 2 P.
Mean semi-daily reduced,	29.979
Monthly range,	0.75

****Air Temperature.*** In Degrees Fahr.

Highest,	85.0, 26th, 3 P.
Lowest,	37.0, 3d, 5.30 A.
Mean hourly,	60.1
Mean of means of max. and min.,	60.3
Mean sensible (wet bulb),	53.8
Monthly range,	48.0
Highest mean daily,	69.0, 24th
Lowest mean daily,	49.7, 17th
Mean maximum,	73.2
Mean minimum,	47.3
Mean daily range,	25.9
Greatest daily range,	41.5, 3d
Least daily range,	6.5, 19th

Humidity.

Mean dew point,	48.4
Mean force of vapor,	.516
Mean relative humidity,	69.7

Precipitation. In inches.

Total precipitation,	4.55
Number of days on which .01 inch or more rain or melted snow fell,	14

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3830 m.
Greatest daily movement,	289 m.,23d
Least daily movement,	40m., 13th
Mean daily movement,	123m.
Mean hourly velocity,	5.1m.

Maximum pressure per square foot, 11.0 lbs.= 47 m. per hour, 26th, 3 P., W.

Prevailing Direction, South, Southwest.

Summary.

South,	26 per cent.
West,	13 " "
Southeast,	10 " "
South, Southeast,	10 " "
North, Northwest,	10 " "
Other directions,	31 " "

Weather.

Mean cloudiness observed,	45 per cent.
Total cloudiness recorded by the Sun Thermometer,	197 hrs.=43 per cent.
Number of clear days,	11
Number of fair days,	10
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded, 256 hrs.=57%

Rain, 1st, 9th, 10th, 15th, 16th, 17th, 18th, 19th, 20th, 24th, 25th, 26th, 27th, 30th, 31st.

Hail, 26th.

Gales, 35 miles or more per hour, 36m. 1st, S.S.E.; 47m. 26th, W.; 35m. 27th, W.N.W.

Thunder and Lightning, 19th,20th, 26th, 25th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.09	29.76	29.900	67.0	4:30 P	42.5	4 A	54.7	55.6	52.7	4
2	30.35	30.09	30.247	71.5	3 P	38.5	6 A	55.0	56.4	48.7	14
3	30.37	30.22	30.327	78.5	5 P	37.0	5:30 A	57.7	57.0	46.7	11
4	30.33	30.16	30.241	77.5	2 P	40.0	6 A	58.7	58.7	48.7	11
5	30.19	29.97	30.065	81.5	3 P	45.5	5 A	63.5	65.4	55.0	10
6	30.20	30.07	30.186	78.0	3 P	49.0	6 A	63.5	62.7	51.0	13
7	30.21	30.06	30.153	79.5	2 P	42.5	5:30 A	61.0	61.2	53.0	14
8	30.11	29.89	29.971	75.5	3 P	52.5	6 A	64.0	63.0	57.5	12
9	29.89	29.63	29.730	64.0	4 P	49.5	5:30 A	56.7	57.7	58.0	0
10	29.97	29.72	29.900	77.5	3 P	53.5	6 A	65.5	61.7	54.5	9
11	30.11	29.96	30.039	73 0	4 P	48.0	12 P	60.5	60.0	51.3	12
12	30.12	30.02	30.090	74.0	4 P	40.0	5 A	57.0	58.0	48.5	13
13	30.10	29.98	30.087	83.5	5:30 P	43.0	5:30 A	63.3	62.8	53.3	12
14	30.08	29.90	30.013	73.0	2 P	45.5	5:30 A	59.3	58.8	54.5	10
15	29.90	29.71	29.777	59.0	11 A	48.0	12 P	53.5	53.5	51.5	0
16	29 93	29.70	29.801	57.0	5 P	43.0	12 P	50.0	50.1	46.7	4
17	30.01	29.93	29.994	61.5	1 P	40.5	4:30 A	51.0	49.7	48.3	1
18	30.00	29.83	29.906	63.5	11 A	46.5	0 A	55.0	55.1	53.5	1
19	29.86	29.74	29.786	57.0	5 P	50.5	5 A	53.7	53.0	51.3	0
20	29.75	29.62	29.685	70.5	2 P	51.5	0 A	61.0	59.4	54.5	5
21	29.91	29.72	29.844	76.5	2 P	49.5	5:30 A	63.0	61.7	54.3	12
22	29.97	29.87	29.938	81.0	4 P	47.0	5:30 A	64.0	64.9	56.7	14
23	29.98	29.86	29.931	76.5	3 P	53.5	5:30 A	65.0	64.8	58.5	11
24	30.06	29.90	29.983	84.5	5 P	56.0	12 P	70.3	69.0	60.5	11
25	30.13	29 92	30.071	83.5	4 P	51.5	2:30 A	67.5	67.1	60.7	12
26	30 00	29.75	29.849	85.0	3 P	62.0	5:30 A	73.5	68.6	64.3	7
27	29.94	29.65	29.763	74.5	2 P	49.0	12 P	61.7	63.7	56.7	6
28	30.08	29.94	30.026	72.5	3:30 P	43.0	4 A	57.7	59.6	51.3	15
29	30.15	29.95	30.045	76.5	2 P	41.0	5 A	58.7	62.1	54.7	9
30	29.95	29 84	29.877	68.0	4 P	54.0	4:30 A	61.0	61.4	59 3	0
31	30.22	29.91	30.126	69.0	2:30 P	53.0	6 A	61.0	60.7	52.0	3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	49 5	.468	75.5	S.E.	92	6.5	36	2 P	12 M	1 P	.02	
2	43.0	.420	67.5	S.	86	2.0	20	7 P				
3	37.0	.443	51 0	S.S.E.	110	2.5	22	7.30 P				
4	40.0	.473	53.0	S.S.E.	104	2.5	22	3 P				
5	47.0	.621	54.0	N.N.W.	171	4.0	28	1 P				
6	41.5	.528	49.5	S.	69	2.0	20	7 P				
7	47.5	.510	65.0	S.	148	4.5	30	4 P				
8	54.0	.591	74.0	S.	272	4.5	30	1 P				
9	57.5	.507	92.0	N.	104	1.0	14	1 P	7 30 A	9 P	.65	
10	52.0	.492	79.5	W.N.W.	59	3.0	24	1.30 A	1 P	10 P	.20	
11	45.5	.489	61.5	N.W.	127	2.0	20	5 P				
12	40.5	.477	52.0	N.N.W.	110	4.5	30	7 A				
13	45.0	.563	52.5	N.E.	40	2.0	20	5.30 P				
14	51.5	.492	78.0	E.N.E.	128	1.5	17	8 P				
15	50.5	.405	89.5	E.N.E.	99	1.0	14	2 P	12 M	12 P	.64	
16	43 5	.365	77.0	W.	142	4.5	30	5 P	8 A	12 M	.01	
17	45.5	.380	80.0	S.	90	1.5	17	2 P	2.30 P	12 P	.20	
18	52.0	.452	84.0	N.N.E.	135	3.0	24	10 A	0 A	12 P	.11	
19	50.0	.393	62.0	N.	73	2.0	20	6 P	0 A	7 P	.22	
20	52.0	.486	79.5	W.	62	3.0	24	2 P	9.30 A	10 A	.01	
21	49.0	.526	66.5	S.E.	76	4.5	30	8 A				
22	50.0	.632	58.0	S.	87	3.0	24	6 P				
23	53.5	.623	66.0	S.	289	4.5	30	2 P				
24	57.0	.636	73.5	W.	167	3.0	24	3 P	0 A	6 A	.05	
25	58.5	.608	81.0	S.W.	81	5.0	32	9 P	6.30 P	9 P	.25	
26	62.5	.691	82.5	S.E.	162	11.0	47	3 P	3 P	9.30 P	1.84	
27	52.5	.548	75.0	N.W.	260	6.0	35	3 P	1 A	6 A	.10	
28	43 0	.509	55.0	W.	150	5.5	33	3 P				
29	47.0	.590	54.5	S.	100	4.0	28	11 A				
30	57.5	.552	86.5	S.S.E.	163	1.5	17	5 A	8 A	9 P	.25	
31	45 0	.527	55.5	N.N.W.	84	2.5	22	8 A	3.30 P		T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather for the month was seasonable in most respects and vegetation made good progress, although still considerably backward. The most noticeable characteristics were a rather large precipitation and more than the average amount of sunshine.

A comparison of the records with those of previous years shows the following features of more or less interest: the mean barometer was nearly normal and the range was less than usual. The pressure was generally unsteady throughout the month although the fluctuations were in most cases quite small.

The total wind movement was about 15 per cent less than usual, much of it coming from the South.

The mean temperature was three degrees above the normal,—the first time it has been above the normal since last October—and the range was much less than usual owing to an unusually high minimum. The minimum was the highest on our records here for May. The mean dew point was nearly normal and the relative humidity about 3 per cent higher than usual.

The total precipitation was about 20 per cent more than the normal, more than half the amount occurring during the last week of the month. The showers on the afternoon of the 26th were the most severe that have occurred in this locality for several years. Several distinct storms occurred in rapid succession, the first being accompanied by a moderate amount of hail. Heavy thunder and intense lightning was prevalent for more than three hours and the rainfall amounted to more than one and three-fourths inches.

No frosts were noted during the month.

J. E. OSTRANDER. Meteorologist.

F. F. HENSHAW. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 186. JUNE, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.05, 9th, 8 P.
Minimum reduced to freezing,	29.25, 22d, 5 A.
Reduced† maximum reading,	30.35, 9th, 8 P.
Reduced† minimum reading,	29.54, 22d, 5 A.
Mean semi-daily reduced,	30.021
Monthly range,	0.81

****Air Temperature.*** In Degrees Fahr.

Highest,	92.5, 26th, 3 P.
Lowest,	41.0, 10th, 5 A.
Mean hourly,	65.0
Mean of means of max. and min.,	65.3
Mean sensible (wet bulb),	59.6
Monthly range,	51.5
Highest mean daily,	79.5, 26th
Lowest mean daily,	54.8, 10th
Mean maximum,	77.4
Mean minimum,	53.3
Mean daily range,	24.1
Greatest daily range,	37.5, 11th
Least daily range,	8.5, 29th

Humidity.

Mean dew point,	56.6
Mean force of vapor,	.616
Mean relative humidity,	77.0

Precipitation. In inches.

Total precipitation,	5.35
Number of days on which .01 inch or more rain or melted snow fell,	11

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3127 m.
Greatest daily movement,	223 m., 15th
Least daily movement,	12m., 3d
Mean daily movement,	104m.
Mean hourly velocity,	4.3m.

Maximum pressure per square foot, 6.0 lbs.= 35 m. per hour, 25th, 6 P., S. W.

Prevailing Direction, South.

Summary.

South,	20 per cent.
Southwest,	10 " "
South, Southeast,	13 " "
Other directions,	57 " "

Weather.

Mean cloudiness observed,	59 per cent.
Total cloudiness recorded by the Sun Thermometer,	201 hrs.=44 per cent.
Number of clear days,	14
Number of fair days,	7
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, . . . 256 hrs.=56%

Rain, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 16th, 21st. 22d, 25th, 28th, 29th, 30th.

Gales, 35 miles or more per hour, 35 m. 25th, S.W.

Thunder and Lightning, 5th, 7th, 8th, 25th, 30th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.26	30.16	30.220	66.5	3 P	53.5	6 A	60.0	57.1	51.0	1
2	30.18	30.09	30.139	67.0	4 P	50.0	6 A	58.5	56.8	52.5	0
3	30.09	29.89	29.963	78.5	5 P	53.0	5 A	65.7	62.1	60.0	7
4	30.15	29.99	30.111	80.5	3 P	56.0	5 A	68.3	70.1	65.0	8
5	30.12	29.80	29.903	87.5	2:30 P	60.5	4 A	74.0	70.4	66.8	7
6	29.93	29.80	29.902	74.0	3 P	57.0	12 P	65.5	65.8	58.3	3
7	29.93	29.84	29.870	73.0	4 P	54.0	5 A	63.5	64.2	62.0	3
8	30.00	29.87	29.932	76.0	12 M	60.0	12 P	68.0	65.8	62.7	2
9	30.35	30.00	30.267	63.5	11 A	45.0	12 P	54.3	55.3	50.0	2
10	30.34	30.07	30.235	67.5	6 P	41.0	5 A	54.3	54.8	51.0	12
11	30.07	29.91	29.994	81.5	3 P	44.0	5:30 A	62.7	62.0	56.0	12
12	30.23	30.06	30.115	76.0	3 P	46.0	5:30 A	61.0	59.9	53.7	13
13	30.27	30.19	30.243	67.0	5 P	46.0	5 A	56.5	57.0	51.7	12
14	30.26	30.09	30.174	72.5	4 P	46.5	4 A	59.5	59.4	54.0	14
15	30.16	30.01	30.061	74.0	3 P	46.5	5 A	60.3	60.6	53.3	10
16	30.09	29.98	30.039	80.5	5 P	55.0	3 A	67.7	64.6	57.7	12
17	30.12	30.01	30.078	79.0	3 P	52.5	5 A	65.7	66.3	60.0	14
18	30.03	29.92	29.978	80.0	4 P	53.0	5:30 A	66.5	68.1	61.0	13
19	30.11	29.98	30.043	83.5	6 P	50.5	5:30 A	67.0	68.8	62.3	14
20	30.01	29.77	29.907	85.5	4 P	54 0	5:30 A	69.7	71.6	63.3	14
21	29.77	29.55	29.623	84.5	12 M	66.5	4 A	75.5	73.7	68.7	12
22	29.98	29.54	29.716	81.5	1 P	57.0	12 P	69.3	69.6	62.5	10
23	30.29	29.98	30.237	77.5	5 P	47.0	5 A	62.3	64.3	57.7	14
24	30.31	30.12	30.211	82.5	4 P	52.0	5 A	67.3	68.2	63.0	14
25	30.13	29.87	29.971	92.0	3 P	58.0	5 A	75.0	72.9	67.5	9
26	29.91	29.84	29.874	92.5	3 P	66.0	5 A	79.3	79.5	72.0	10
27	30.11	29.91	30.035	83.5	1:30 P	58.5	12 P	71.0	70.2	58.7	9
28	30.20	30.05	30.031	73.5	11:30 A	47.5	5 A	60.5	62.8	57.0	5
29	30.05	29.88	29.922	67.5	5 P	59.0	5 A	63.3	62.5	60.5	0
30	29.92	29.80	29.851	73.0	2 P	63.0	5 A	68.0	67.0	66.7	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	47.5	.437	75.0	N.N.E.	142	2.0	20	6 P				
2	50.5	.434	83.5	N.N.E.	147	1.5	17	6 A	7:30 A	12 P	T	
3	58.5	.574	88 5	E.	12	0.0	—	—	0 A	6 A	.10	
4	62.5	.735	75.5	S.	76	2.0	20	6 P	11 P	12 P	.17	
5	66.0	.701	91.5	S.W.	206	4.5	30	2 P	3 P	9 P	.63	
6	55.5	.555	80.5	E.	110	1.0	14	5 A	8 P	12 P	.64	
7	60.5	.612	88.5	S.S.W.	39	0.5	10	10 P	0 A	12 P	.96	
8	61.5	.618	88.5	N.E.	60	1.0	14	4 P	10:30 A	12 P	.14	
9	48.5	.386	88.5	E.N.E.	133	2.0	20	11 A	0 A	9 P	.52	
10	47.5	.436	76.5	N.	48	0.5	10	9 A				
11	52.0	.546	71.5	E.S.E.	79	1.5	17	2 P				
12	49.0	.503	70.0	E.S.E.	116	2.0	20	10 A				
13	46.5	.479	67.0	S.S.E.	104	1.0	14	10 P				
14	49.0	.524	67.5	S.	160	2.5	22	5 P				
15	48.5	.508	66.5	S.S.E.	223	3.0	24	12 M				
16	55 0	.558	78.5	S.W.	107	1.0	14	10 A	6 A	8 A	T	
17	56.5	.674	70.5	S.W.	53	0.5	10	4 P				
18	57.5	.655	72.5	W.S.W.	146	4.5	30	3 P				
19	58.5	.705	69.0	W.N.W.	57	2.0	20	1 P				
20	58.5	.746	68.0	S.	96	2.5	22	7 P				
21	66.5	.795	83.5	W.	150	2.0	20	12 M	0 A	1:30 P	.01	
22	56.5	.709	67.5	N.W.	125	5.0	32	6 P	3.30 P	4 P	T	
23	53.0	.601	69.0	S.S.E.	104	1.0	14	2 P				
24	60.0	.679	76.5	S.	175	1.5	17	1 P				
25	65.5	.761	83.5	S.	121	6.0	35	6 P	5 P	11:30 P	.01	
26	68.5	1.002	69.0	W.	104	2.5	22	1 P				
27	60.0	.703	75.0	N.N.W.	94	2.5	22	3 P				
28	52.0	.578	68.0	S.S.W.	48	0.5	10	4 P	3 P	12 P	T	
29	59.0	.567	88.0	S.S.E.	58	0.5	10	2 A	0 A	12 M	.50	
30	66.5	.690	92.5	S.	64	2.5	22	6 P	4 A	11 P	1.67	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during June was seasonable in most respects; the variations from the normals being generally unimportant excepting only the precipitation record which was nearly 40 per cent. more than usual.

The first decade of the month was cloudy most of the time with rain every day excepting the 1st and 10th. The temperature gradually rose until the middle of the period and then decreased until the end of the period when the lowest mean daily record was noted.

From the 10th to the 29th scarcely more than a trace of rain was noted and every day was recorded either as clear or fair. The days were generally warm without excessive heat, the maximum going above 90 degrees but twice. The nights were cool without exception, the minimnm records going below 50 degrees on about a third of the days. The last two days of the month were stormy with a heavy precipitation, especially during the last afternoon.

The total wind movement was slightly more than 80 per cent of the normal and nearly every point of the compass was represented in the record of "prevailing directions." The hours of bright sunshine recorded were considerably in excess of the usual number.

J. E. OSTRANDER Meteorologist.

G. H. PATCH. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 187. JULY, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.96, 4th, 6 A.
Minimum reduced to freezing,	29.25, 12th, 6 P.
Reduced† maximum reading,	30.26, 4th, 6 A.
Reduced† minimum reading,	29.53, 12th, 6 P.
Mean semi-daily reduced,	29.979
Monthly range,	0.73

****Air Temperature.*** In Degrees Fahr.

Highest,	94.5, 19th, 3 P.
Lowest,	46.5, 4th, 3 A.
Mean hourly,	69.8
Mean of means of max. and min.,	70.4
Mean sensible (wet bulb),	64.4
Monthly range,	48.0
Highest mean daily,	78.8, 19th
Lowest mean daily,	61.0, 23d
Mean maximum,	81.6
Mean minimum,	59.2
Mean daily range,	22.4
Greatest daily range,	33.0, 4th
Least daily range,	7.5, 23d

Humidity.

Mean dew point,	61.5
Mean force of vapor,	.720
Mean relative humidity,	77.7

Precipitation. In inches.

Total precipitation,	2.62
Number of days on which .01 inch or more rain or melted snow fell,	14

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3268 m.
Greatest daily movement,	235 m., 31st
Least daily movement,	9m., 6th
Mean daily movement,	105m.
Mean hourly velocity,	4.4m.

Maximum pressure per square foot, 11.0 lbs.= 47 m. per hour, 1st, 11 A., S.

Prevailing Direction, Southwest.

Summary.

South,	32 per cent.
West Northwest,	16 " "
West,	10 " "
South, Southwest,	10 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	55 per cent.
Total cloudiness recorded by the Sun Thermometer,	188 hrs.=41 per cent.
Number of clear days,	12
Number of fair days,	12
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, 274 hrs.=59%

Rain, 1st, 2d, 5th, 8th, 10th, 12th, 18th, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 31st.

Gales, 35 miles or more per hour, 47 m. 1st, S.; 37 m. 2d, W.

Thunder and Lightning, 1st, 5th, 26th, 29th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimun.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.85	29.79	29.837	79.5	11:30 A	68.5	5 A	74.0	69.4	69.0	6
2	30.05	29.86	29.944	73.0	3 P	55.0	4 A	64.0	64.6	56.7	8
3	30.22	30.05	30.173	72.5	3 P	51.0	12 P	61.7	61.8	54.3	13
4	30.26	30.05	30.146	79.5	3 P	46.5	3 A	63.0	64.5	60.0	14
5	30.07	29.89	29.943	87.0	1:30 P	64.0	0 A	75.5	72.5	69.3	9
6	30.04	29.97	30.006	84.0	3 P	63.5	7 A	73.7	72.3	67.0	10
7	30.07	30.00	30.037	84.0	4:30 P	64.5	6 A	74.3	73.4	66.7	11
8	30.12	30.05	30.084	85.5	5:30 P	63.0	5 A	74.3	71.4	64.7	10
9	30.11	30.02	30.077	85.5	3 P	57.0	5:30 A	71.3	71.1	64.5	12
10	30.06	29.89	29.948	77.0	6 P	60.5	1:30 A	68.7	67.2	65.3	8
11	29.89	29.72	29.800	84.0	4 P	60.0	3:30 A	72.0	72.2	68.5	5
12	29.76	29.53	29.630	83.5	3:30 P	68.5	5:30 A	76.0	74.4	68.3	3
13	29.97	29.59	29.790	77.0	2 P	52.0	12 P	64.5	66.8	59.5	11
14	30.09	29.97	30.078	80.0	4:30 P	48.0	4 A	64.0	65.8	59.5	15
15	30.10	29.97	30.093	80.0	3 P	55.5	5:30 A	67.7	68.4	63.3	9
16	29.99	29.87	29.909	88.5	2 P	63.5	5 A	76.0	74.4	66.5	11
17	29.95	29.88	29.935	87.5	4:30 P	57.5	5:30 A	72.5	72.0	64.3	14
18	29.95	29.83	29.896	90.0	5 P	61.5	2 A	75.7	75.0	69.3	10
19	29.91	29.80	29.861	94.5	3 P	64.5	5 A	79.5	78.8	72.0	9
20	29.84	29.78	29.792	83.5	5 P	61.0	12 P	72.3	74.4	64.3	14
21	29.91	29.84	29.867	82.0	4 P	57.0	4:30 A	69.5	70.0	62.0	12
22	30.03	29.91	30.007	77.5	2:30 P	51.0	5:30 A	64.3	64.7	59.3	5
23	30.04	29.98	30.009	66.0	3:30 P	58.5	2 A	62.3	61.0	59.7	0
24	30.08	30.04	30.071	69.0	2:30 P	60.5	5 A	64.7	63.8	62.3	0
25	30.16	30.05	30.118	79.5	4:30 P	62.0	5 A	70.7	68.8	65.7	3
26	30.16	30.07	30.124	82.5	1 P	66.0	4 A	74.3	73.2	69.5	6
27	30.12	30.03	30.087	83.0	4 P	65.0	12 P	74.0	72.7	67.7	8
28	30.11	29.97	30.053	84.0	1:30 P	64.0	2:30 A	74.0	71.3	67.5	7
29	30.12	29.93	30.007	84.0	3 P	56.0	12 P	70.0	70.7	61.5	11
30	30.17	30.07	30.125	77.5	4 P	48.5	5 A	63.0	65.8	60.7	12
31	30.10	29.90	29.966	87.0	4 P	61.5	2 A	74.3	72.9	68.7	8

DAILY SUMMARY.

Day.	Humidity.			Wind.				Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	68.0	.747	91.5	S.S.E.	189	11.0	47	11 A	11 A	9 P	.51	
2	48.5	.652	55.5	W.	157	7.0	37	2 P	4 A	1 P	.06	
3	48.0	.530	65 5	N.W.	89	2.5	22	10 A				
4	57.0	.617	76.5	S.	132	4.0	28	5 P				
5	68.0	.775	88.0	S.S.W.	229	3.5	26	2 P	3 P	5 P	.55	
6	64.5	.755	82.5	W.S.W.	9	0.5	10	9 P				
7	64.0	.776	76.0	N.N.W.	48	0.5	10	11 A				
8	63.0	.705	82.5	S.S.W.	17	1.0	14	7 P	7 A	8 A	T	
9	61.0	.742	74.5	S.	107	2.0	20	4 P				
10	62.5	.695	84.0	S.	49	0.5	10	1 A	12:30 P	2 P	.07	
11	67.0	.765	87.0	S.	62	1.0	14	5 P				
12	66.0	.785	82.5	S.	198	4.5	30	3 P	9 P	10 P	.06	
13	55.5	.617	72.0	W.N.W.	123	2.5	22	6 P				
14	55.5	.625	71.5	N.N.W.	45	0.5	10	12 M				
15	59.5	.701	74.5	S.W.	126	2.0	20	6 P				
16	63.0	.822	69.5	S.W.	111	1.5	17	3 P				
17	60.0	.791	65.0	W.N.W.	41	1.0	14	1 P				
18	66.5	.854	79.0	W.	43	1.0	14	6 A	4:30 A	7:30 A	.36	
19	70.5	.908	83.5	W.	14	0.5	10	4 P				
20	58.5	.838	59.0	W.N.W.	125	3.5	26	3 P				
21	57.5	.741	63.0	W.N.W.	118	3.0	24	1 P				
22	56.5	.583	78.0	S.E.	43	1.5	17	4 P	7 P	12 P	.09	
23	58.5	.555	88.0	N.N.E.	133	2.5	22	2 P	0 A	12 M	.04	
24	60.5	.606	88.5	N.E.	55	0.5	10	7 A	2 P	12 P	.26	
25	64.5	.686	90.0	S.S.W.	35	0.5	10	11 P	0 A	9 A	.27	
26	68.5	.810	84.0	S.	170	4.5	30	1 P	11:30 A	12 M	.01	
27	65.5	.775	82.5	S.	160	1.0	14	2 A	2 A	5 A	.11	
28	66.0	.733	88.0	S.	166	3.0	24	2 P	4:30 P	12 P	.06	
29	57.5	.675	71.0	W.N.W.	170	4.0	28	11 A	0 A	3 A	.17	
30	57.0	.652	72.0	S.	69	2.0	20	12 P				
31	66.5	.789	84.0	S.	235	3.5	20	7 P	4.30 P	5:30 P	T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during the month was seasonable in most respects and the departures from the normals were generally small and unimportant. The most noticeable variations were the records for precipitation and relative humidity.

A review of the records of the several weather elements, shows the following features of more or less interest: The mean barometer was a little higher than the normal and the range was about 10 per cent more than usual. The chart records were rather unsteady the first half of the month. The total wind movement was a little less than the usual amount and but two gales were recorded.

The mean temperature was about normal; the maximum and minimum were both slightly higher than the averages for these records at this station. The range was a little less than usual. The mean dew point was normal while the relative humidity was more than 5 per cent higher than usual, probably partly due to the change made in the times of observation.

The total precipitation was hardly one-half the usual amount and fell during numerous small storms distributed throughout the month.

The percentage of cloudiness observed was slightly above the mean, the amount in the morning being about a third greater than in the evening. Considerably more than the usual number of hours of sunshine were recorded.

The hay crop is reported from fair to good, corn is backward but has made good progress during the month, potatoes promise a good yield, the outlook for the tobacco crop is excellent.

Apples promise an average crop, plums are above the average, the outlook for other fruit is not encouraging.

G. W. PATCH,
Observer.

J. E. OSTRANDER,
Meteorologist.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 188. AUGUST, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.12, 10th, 0 A.
Minimum reduced to freezing,	29.40, 20th, 5 P.
Reduced† maximum reading,	30.42, 10th, 0 A.
Reduced† minimum reading,	29.69, 20th, 5 P.
Mean semi-daily reduced,	30.030
Monthly range,	0.73

****Air Temperature.*** In Degrees Fahr.

Highest,	89.5, 1st, 6A.
Lowest,	40.0, 27th, 6 A.
Mean hourly,	66.4
Mean of means of max. and min.,	66.9
Mean sensible (wet bulb),	61.3
Monthly range,	49.5
Highest mean daily,	74.5, 1st
Lowest mean daily,	57.4, 10th
Mean maximum,	79.2
Mean minimum,	54.5
Mean daily range,	24.7
Greatest daily range,	37.5, 24th
Least daily range,	10.0, 2d

Humidity.

Mean dew point,	59.0
Mean force of vapor,	.630
Mean relative humidity,	80.5

Precipitation. In inches.

Total precipitation,	4.09
Number of days on which .01 inch or more rain or melted snow fell,	11

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3229 m.
Greatest daily movement,	231 m., 5th
Least daily movement,	26m., 27th
Mean daily movement,	104m.
Mean hourly velocity,	4.3m.

Maximum pressure per square foot, 65.0 lbs.= 36 m. per hour, 20th, 4 P., S.

Prevailing Direction, South Southwest.

Summary.

South,	35 per cent.
Northwest,	10 " "
West,	10 " "
South, Southwest,	10 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	47 per cent.
Total cloudiness recorded by the Sun Thermometer,	137 hrs.=32 per cent.
Number of clear days,	11
Number of fair days,	14
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, . . . 292 hrs.=68%

Rain, 1st, 2d, 3rd, 6th, 8th, 10th, 11th, 13th, 14th, 17th, 20th, 22d, 23d.

Gales, 35 miles or more per hour, 36 m. 20th, S.

Thunder and Lightning, 1st, 2nd, 7th, 8th, 10th, 17th, 20th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.98	29.90	29.953	89.5	3 P	67.5	12 P	78.5	74.5	69.5	12
2	29.97	29.91	29.953	75.5	3 P	65.5	12 P	70.5	70.2	67.0	0
3	30.09	29.96	30.026	82.0	12:30 P	61.5	5:30 A	71.7	71.8	66.7	10
4	30.15	30.06	30.119	82.5	3:30 P	62.5	4 A	72.5	70.5	66.0	5
5	30.11	29.90	30.017	77.0	2:30 P	65.0	5 A	71.0	69.3	65.7	2
6	29.90	29.73	29.782	83.5	4 P	62.5	5 A	73.0	73.2	68.5	8
7	29.96	29.78	29.903	83.0	4 P	61.0	6 A	72.0	71.8	66.0	10
8	30.25	29.92	30.025	77.5	3:30 P	56.5	12 P	67.0	65.7	60.5	6
9	30.42	30.25	30.399	79.0	5 P	46.0	6 A	62.5	63.0	57.3	13
10	30.42	30.05	30.259	67.0	5 P	49.5	5 A	58.3	57.4	57.7	0
11	30.08	29.94	30.025	81.0	3 P	61.0	4 A	71.0	69.2	63.3	8
12	30.24	30.08	30.193	74.0	2 P	53.0	5:30 A	63.5	64.6	62.3	10
13	30.23	29.95	30.091	75.5	4 P	58.5	5 A	67.0	64.4	60.5	6
14	29.95	29.72	29.791	77.0	3:30 P	61.5	3 A	69.3	67.4	63.0	4
15	29.89	29.75	29.825	84.0	4 P	54.0	6 A	69.0	69.4	63.7	12
16	29.91	29.83	29.878	81.5	12:30 P	56.0	5:30 A	68.7	66.8	62.5	10
17	29.84	29.80	29.827	84.0	3 P	63.0	3 A	73.5	71.8	65.3	8
18	30.11	29.84	29.988	84.0	2 P	52.0	12 P	68.0	66.9	59.0	12
19	30.22	30.11	30.201	77.5	3 P	43.0	6 A	60.3	61.1	56.0	12
20	30.18	29.69	29.911	74.0	3 P	55 0	6 A	64.5	62.3	64.0	0
21	30.07	29.77	29.987	84.0	5 P	57.0	12 P	70.5	70.1	62.3	10
22	30.12	29.92	30.024	81.5	3 P	51.0	5 A	66.3	67.3	62.7	8
23	30.25	29.97	30.172	77.0	3 P	49.0	12 P	63.0	64 9	57.7	13
24	30.24	30.10	30.183	80.5	4 P	43.0	6 A	61.7	62.0	55.5	13
25	30.10	29 76	29.928	81.5	2 P	55.5	5:30 A	68.5	68.7	64.5	12
26	30.15	29.73	29.916	71.5	3 P	47.0	12 P	59.3	63.4	54.0	11
27	30.24	30.11	30.180	76.0	4 P	40.0	6 A	58.0	59.3	52.7	13
28	30.14	29.97	30.040	82.5	3 P	46.0	6:30 A	64.3	64.4	59.5	13
29	30.11	29.91	29.975	80.0	1 P	48.0	6 A	64.0	64.8	60.0	7
30	30.21	30.11	30.165	73.5	5 P	48.0	6 A	60.7	39.6	53.0	6
31	30.23	30.15	30.197	79.0	4 P	49.5	6 A	64.3	61.8	54.0	9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	68.0	.794	87.5	S.S.E.	170	3.0	24	4 A	4:30 P	6 P	.01	
2	66.0	.720	88.0	S.S.W.	56	0.5	10	1 A	1 A	8 P	.39	
3	63.5	.794	75 0	N.E.	69	0.5	10	8 A	1:30 P	2 P	T	
4	64.5	.693	89.5	S.	65	2.5	22	7 P				
5	64.0	.701	85.5	S.	231	4.0	28	4 P				
6	66.5	.803	81.0	S.	110	1.0	14	3 P	7:30 A	8 A	T	
7	63.5	.755	76.5	W.	92	2.0	20	1 P				
8	58.0	.598	81.5	N.W.	76	2.0	20	6 P	6 A	7:30 A	.22	
9	53.5	.563	73.0	S.	40	0.5	10	8 P				
10	56.5	.517	90.5	S.	44	0.5	10	4 P	7 A	12 P	1.04	
11	61.5	.686	79.0	N.W.	95	4.0	28	5 P	0 A	3 A	.21	
12	59.5	.650	79.5	N.	109	2.5	22	9 A				
13	58.5	.592	83.0	S.	151	3.0	24	4 P	11 P	12 P	.04	
14	60.5	.674	78.5	S.	150	0.5	10	1 A	0 A	8 A	.02	
15	62.0	.680	80.5	W.	31	0.5	10	3 P				
16	61.5	.615	87.5	S.S.E.	64	3.0	24	4 P				
17	64.0	.695	84.0	S.W.	84	2.0	20	4 P	9 P	11 P	.06	
18	56.5	.588	77.0	W.N.W.	140	3.5	26	11 A				
19	53.5	.521	79.0	W.	35	1.0	14	10 A				
20	54.5	.627	97.5	S.	223	6.5	36	4 P	1 A	10 P	2.03	
21	59.5	.650	79.0	N.N.W.	109	1.5	17	2 A				
22	61.0	.661	82.0	S.	150	3.0	24	2 P	8 P	12 P	.02	
23	54.5	.576	74.0	N.	164	2.5	22	7 A	0 A	2 A	.05	
24	52.0	.531	74.0	S.	36	0.5	10	2 P				
25	63.5	.667	86.5	S.	215	4.5	30	2 P				
26	49.5	.532	66.0	N.W.	220	5.0	32	9 A				
27	48.5	.481	71.5	S.S.W.	26	0.5	10	2 P				
28	57.5	.586	80.5	S.S.W.	56	1.5	17	2 P				
29	57.0	.606	77.0	N.N.W.	117	3.0	24	12 M				
30	49.0	.485	72.0	N.E.	44	0.0	—	—				
31	51.0	.480	78.0	E.S.E.	57	0.5	10	11 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during August was more agreeable than usual for the time of year. Hot and sultry days were comparatively few while the number of clear and fair days was unusually large. The last eleven days of the month were especially pleasant. With practically no rain, bright, sunshiny days without excessive heat and rather cool nights, the period was all that could be desired. The mean barometer was unusually high and the fluctuations of pressure while not especially large were more pronounced than usual. The maximum pressure was rather high and the range a little more than normal.

The mean temperature was slightly below the normal and the minimum was the lowest August record since 1895. The daily maximum was between 80 and 90 degrees on sixteen dates and the minimum below 50 degrees on eleven dates. The mean dew point was about a degree below the normal and the relative humidity about 5 per cent higher than usual, probably due to the reason mentioned in last month's bulletin. The total wind movement was about 10 per cent greater than the normal.

The total precipitation was nearly normal; three fourths of it falling during the two storms on the 10th and 20th respectively. The number of hours of bright sunshine was unusually large and the number of cloudy days few.

The tobacco crop is practically all harvested and a heavy yield of excellent quality is reported. Corn is backward but filling out well and unless injured by frost a good yield is expected. Apples are a fair crop and of fine quality. Plums have been plentiful. There are practically no peaches in this vicinity this year.

J. E. OSTRANDER. Meteorologist

G. W. PATCH. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 189. SEPTEMBER, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.31, 23d, 8 A.
Minimum reduced to freezing,	29.14, 30th, 1 P.
Reduced† maximum reading,	30.62, 23d, 8 A.
Reduced† minimum reading,	29.42, 30th, 1 P.
Mean semi-daily reduced,	30.081
Monthly range,	1.20

****Air Temperature.*** In Degrees Fahr.

Highest,	84.5, 12th, 2:30 P.
Lowest,	26.0, 23d, 7 A.
Mean hourly,	59.8
Mean of means of max. and min.,	60.2
Mean sensible (wet bulb),	55.1
Monthly range,	58.5
Highest mean daily,	73.0, 3d
Lowest mean daily,	41.3, 22d
Mean maximum,	71.5
Mean minimum,	49.1
Mean daily range,	22.4
Greatest daily range,	36.0, 7th
Least daily range,	7.0, 14th

Humidity.

Mean dew point,	52.7
Mean force of vapor,	.505
Mean relative humidity,	81.8

Precipitation. In inches.

Total precipitation,	5.45
Number of days on which .01 inch or more rain or melted snow fell,	14

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3602 m.
Greatest daily movement,	294 m., 24th
Least daily movement,	19m., 5th
Mean daily movement,	120m.
Mean hourly velocity,	5.0m.
Maximum pressure per square foot, 14.5 lbs.= 54 m. per hour, 30th, 3 P., W.N.W.	
Prevailing Direction, Southwest.	

Summary.

South,	30 per cent.
North, Northwest,	13 " "
North,	10 " "
South, Southeast,	10 " "
Other directions,	37 " "

Weather.

Mean cloudiness observed,	54 per cent.
Total cloudiness recorded by the Sun Thermometer,	169 hrs.=45 per cent.
Number of clear days,	11
Number of fair days,	9
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded,	204 hrs.=55%

Rain, 1st, 2d, 3d, 4th, 8th, 9th, 12th, 13th, 14th, 15th, 20th, 24th, 25th, 26th, 28th, 29th, 30th.

Gales, 35 miles or more per hour, 35m. 20th, N.: 54m. 30th, W.N.W.

Thunder and Lightning, 4th, 12th, 14th, 15th, 29th.

Killing Frost, 22d, 23d.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.27	30.12	30.207	71.0	2 P	48.5	5 A	59.7	60.0	55.5	2
2	30.12	30.04	30.074	78.0	2 P	61.5	3 A	69 7	69.6	66.3	3
3	30.08	29.91	29.999	80.5	3:30 P	67.5	5 A	74.0	73.0	69.0	3
4	29.99	29.88	29.942	76.5	2 P	54.5	12 P	65.5	68.7	62.3	8
5	30.13	29.96	30.014	75.5	5 P	49.0	6 A	62.3	60.9	56.3	9
6	30.27	30.13	30.250	71.0	4 P	42.0	6 A	56.5	55.2	49.3	13
7	30.25	30.09	30.169	74.5	4 P	38.5	5:30 A	56.5	55.7	50.5	10
8	30.14	29.97	30.065	80.0	3 P	47.0	6:30 A	63.5	61.9	56.3	6
9	30.22	30.14	30.206	59.0	1 A	50.0	12 P	54.5	52.8	51.0	0
10	30.22	30.16	30.198	66.0	4 P	50.0	3 A	58.0	57.2	55.3	0
11	30.18	29.98	30.087	79.5	4 P	55.0	5 A	67.3	67.4	63.7	11
12	30.13	29.92	30.000	84.5	2:30 P	61.0	12 P	72.7	70.2	63.5	8
13	30.34	30.13	30.333	74.5	1 P	53.0	7 A	63.7	62.3	53.5	5
14	30.31	29.81	30.101	61.5	3 P	54.5	7:30 A	58.0	58.3	57.7	0
15	30.18	29.60	29.893	64.5	4 P	45.0	12 P	54.7	54.9	50.5	4
16	30.22	30.03	30.119	68.0	4 P	37.5	6 A	52.7	52.6	49.5	11
17	30.04	29.98	30.009	76.0	4 P	48.0	6 A	62.0	61.9	55.7	10
18	30.04	29.91	29.980	81.0	3 P	52.0	7 A	66.5	66.1	61.0	11
19	30.16	29.97	30.101	79.0	4 P	59.5	6:30 A	69.3	67.1	61.3	11
20	30.16	29.88	29.998	73.5	2:30 P	57.0	12 P	65.3	64.6	60.5	8
21	30.41	29.95	30.262	63.5	3 P	37.0	12 P	50.3	50.4	39.5	10
22	30.60	30.41	30.530	56.0	4 P	27.5	6:30 A	41.7	41.3	35.5	12
23	30.62	30.37	30.505	61.0	4 P	26.0	7 A	43.5	45.3	40.3	12
24	30.37	29.83	30.044	65.0	4 P	46.5	3 A	55.7	56.3	54.5	10
25	29.93	29.80	29.854	81.0	3 P	55.0	12 P	68.0	66.0	59.3	6
26	29.93	29.77	29.849	67.5	3 P	49.0	6:30 A	58.3	58.5	56.3	4
27	30.08	29.86	29.983	70.5	4 P	47.0	6:30 A	58.7	59.0	54.0	7
28	30.22	30.08	30.195	63.5	3:30 P	47.5	3 A	55.5	53.5	50.3	2
29	30.19	20.70	29.943	65.5	10 P	48.5	5:30 A	57.0	58.7	58.0	0
30	29.70	29.42	29.530	76.0	2 P	57.0	5 A	66.5	65.0	56.0	8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	52.5	.530	74.5	S.S.E.	120	2.0	20	4 P	5:30 P	12 P	T	
2	64.5	.727	83.5	S.S.E.	160	1.0	14	7 P	0 A	3 A	.03	
3	68.0	.779	87 0	S.	201	3.5	26	7 P	11 P	12 P	.01	
4	61.0	.621	85.5	S.W.	121	2.5	22	1 P	0 A	5 A	.02	
5	54.0	.520	80.0	N.W.	19	4.5	30	7 P				
6	44.0	.428	69.0	N.N.W.	85	3.0	24	8 A				
7	49.5	.403	88.5	S.S.W.	30	0.0	—	—				
8	55.0	.492	87.5	N.	105	3.0	24	4 P	3:30 P	12 P	T	
9	50.0	.385	93.5	N.E.	95	0.5	10	4 A	0 A	9 P	.15	
10	53.5	.473	87.5	W.	32	0.0	—	—				
11	62.0	.669	82.5	S.	91	0.5	10	3 P				
12	62.5	.645	86,0	S.	53	1.0	14	6 P	4 P	5 P	.03	
13	49.5	.501	70.0	S.S.E.	101	2.5	22	1 A	9 P	12 P	T	
14	57.0	.484	95.5	W.	51	1.5	17	11 P	0 A	12 P	2.62	
15	50.0	.381	93.5	N.N.W.	200	5.0	32	7 A	0 A	9 A	1.48	
16	47.0	.400	80.0	S.	78	0.0	—	—				
17	54.5	.503	83.5	W.S.W.	127	1.0	14	1 P				
18	59.5	.594	86.0	S.	172	2.5	22	4 P				
19	60.5	.628	85.0	N.E.	96	0.5	10	10 A				
20	59.0	.572	87.0	S.	130	6.0	35	12 P	5 P	11 P	.05	
21	31.0	.307	56.5	N.	264	5.0	32	6 A				
22	28.5	.245	63.5	N.	170	4.5	30	9 A				
23	36.0	.305	71.0	S.	112	5.5	33	5 P				
24	52.5	.481	81.5	S.	294	4.5	30	2 P	6 A	12 P	.09	
25	57.5	.569	81.5	N.N.W.	175	5.0	32	3 P	0 A	2 A	.02	
26	54.5	.495	86.0	E.S.E.	31	0.0	—	—	2 P	5:30 P	.21	
27	51.0	.478	78.5	N.N.W.	34	1.0	14	11 A				
28	48.0	.397	86.0	N.W.	27	0.0	—	—	8:30 A	11 A	.02	
29	57.0	.499	95.5	S.	196	4.0	28	12 M	11 A	9 P	.70	
30	50.5	.555	68.0	S.W.	232	14.5	54	3 P	11 A	11:30A	.02	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The most noticeable features of the weather for September were the heavy rainfall on the 14th and 15th and the frosts on the 22d and 23d. The rainstorm was one of the most severe that has occurred at this station since it was established. Starting on the evening of the 13th with only a trace of rain, and continuing the next morning with only a light drizzle, the storm did not become heavy until well along in the afternoon of the 14th, and up to 8 P. M. the total precipitation was .70 inches. From 8 P. M. until 7 A. M. on the 15th the downfall at times was extremely heavy, and the capacity of the rain gauge was exceeded. The lightning from 10 P. M. until midnight of the 14th was almost incessant. The storm ceased at about 9 A. M. on the 15th, and the total precipitation, as determined by measurement of the depth in receptacles near the Dining Hall, was found to be 4.10 inches.

The first frost of the season occurred on the morning of the 22d, and proved to be unusually severe. Tender plants were killed and much damage done. On the morning of the 23d another heavy frost was noted and the thermometer fell to 26 degrees, making a new low record for September at this station.

The barometer was generally high until near the close of the month, and the minimum for the month occurred on the last day. The mean pressure for the month was considerably above the normal, and the range was nearly 50 per cent more than usual.

The mean temperature was between one and two degrees below the normal, and the range was large, owing to the low minimum record.

The total precipitation was about a third more than usual, and the amount of cloudiness slightly more than normal.

J. E. OSTRANDER Meteorologist.

G. W. PATCH Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 190. OCTOBER, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.20, 7th, 8 A.
Minimum reduced to freezing,	28.99, 21st, 2 P.
Reduced† maximum reading,	30.51, 7th, 8 A.
Reduced† minimum reading,	29.28, 21st, 2 P.
Mean semi-daily reduced,	30.075
Monthly range,	1.23

****Air Temperature.*** In Degrees Fahr.

Highest,	77.5, 17th, 3:30 P.
Lowest,	18.0, 31st, 7 A.
Mean hourly,	47.2
Mean of means of max. and min.,	46.0
Mean sensible (wet bulb),	41.9
Monthly range,	59.5
Highest mean daily,	60.8, 11th
Lowest mean daily,	32.7, 28th
Mean maximum,	58.1
Mean minimum,	33.9
Mean daily range,	24.2
Greatest daily range,	49.0, 17th
Least daily range,	9.0, 9th

Humidity.

Mean dew point,	37.5
Mean force of vapor,	.320
Mean relative humidity,	74.0

Precipitation. In inches.

Total precipitation,	1.74
Number of days on which .01 inch or more rain or melted snow fell,	6

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4160 m.
Greatest daily movement,	340 m., 21st
Least daily movement,	3m., 17th
Mean daily movement,	134.2m.
Mean hourly velocity,	5.6m.
Maximum pressure per square foot, 25.5 lbs.= 69m. per hour, 21st, 12 M., S.S.E.	
Prevailing Direction, Southwest.	

Summary.

South,	29 per cent.
North, Northwest,	16 " "
West,	13 " "
West, Southwest,	10 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	158 hrs.=46 per cent.
Number of clear days,	13
Number of fair days,	9
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, . . . 183 hrs.=54%

Rain, 1st, 5th, 6th, 8th, 10th, 11th, 12th, 13th, 14th, 20th, 21st, 26th.

Gales, 35 miles or more per hour, 47m. 1st, W.: 36m. 11th, S.S.E.: 69m. 21st, S.S.E.: 48m. 30th, N.N.W.

Hail, 12th.

Frost, 7th, 14th, 16th, 23d, 24th, 27th, 28th, 31st.

Snow, 12th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.51	29.32	29.420	59.5	1 P	47.0	12 P	53.3	53.6	45.7	6
2	29.63	30.42	29.531	61.5	1 P	41.0	6 A	51.3	50.8	44.7	8
3	30.08	29.63	29.893	56.0	12 M	36.0	6:30 A	46.0	47.3	45.0	5
4	30.22	30.08	30.216	65.5	4 P	31.0	6:30 A	48.3	48.2	41.0	11
5	30.22	29.94	30.070	66.5	4 P	40.5	6:30 A	53.5	55.1	51.7	5
6	30.35	29.94	30.173	59.0	3 P	37.0	12 P	48.0	52.6	42.0	10
7	30.51	30.35	30.493	55.5	4:30 P	28.0	6 A	41.7	40.3	33.7	11
8	30.48	30.20	30.358	60.0	1 P	25.5	6:30 A	42.7	45.8	42.7	2
9	30.20	30.13	30.185	60.0	2 P	51.0	12 P	55.5	55.2	52.7	1
10	30.15	29.66	29.904	65.5	9 P	48.5	6 A	57.0	55.1	55.5	0
11	30.10	29.62	29.819	66.0	3 P	51.0	12 P	58.5	60.8	55.3	1
12	30.35	30.10	30.331	51.0	0 A	33.0	12 P	42.0	39.1	34.7	0
13	30.32	30.21	30.268	49.0	4 P	33.0	0 A	41.0	40.4	38.5	0
14	30.21	30.07	30.146	58.5	3 P	29.0	7 A	43.7	45.6	39.5	9
15	30.21	30.11	30.196	58.0	3 P	38.0	7 A	48.0	45.6	37.0	9
16	30.24	30.12	30.208	71.0	3:30 P	26.0	7 A	48.5	45.3	36.3	11
17	30.18	30.01	30.115	77.5	3:30 P	28.5	7 A	53.0	48.6	40.0	11
18	30.09	29.86	29.987	74.5	3 P	37 0	7 A	55.7	55.5	44.5	9
19	30.15	30.05	30.121	69.0	3 P	38.0	7 A	53.5	52.1	48.7	10
20	30.09	29.90	29.992	65.0	3 P	51.0	3 A	58.0	57.7	56.5	0
21	29.90	29.28	29.652	67.0	3 P	41.5	12 P	54.3	58.4	54.0	0
22	29.77	29.60	29.723	63.5	2 30 P	32.0	7:30 A	47.7	45 9	38.3	5
23	30.03	29.77	29.916	56.5	2 P	32.0	7 A	44.3	44 9	39.7	6
24	30.32	30.03	30.267	52.0	3 P	29.0	7 A	40.5	40.2	34.3	5
25	30.32	30.12	30.212	62.0	2:30 P	29.5	2 A	45.7	47.6	45.0	6
26	30.15	29.84	29 967	55.0	2 P	38.5	12 P	46.7	45.8	39.5	0
27	30.25	29 90	30.087	45.5	3 P	29.0	12 P	37.3	37.7	32.0	6
28	30 38	30.25	30.340	46.5	3 P	20.5	7 A	33.5	32.7	28.7	9
29	30.31	29.98	30.184	57.5	3 P	31.0	4 A	44.3	43.5	39.3	9
30	30.33	30.10	30.268	45.0	2 P	24.5	12 P	34.7	37.5	31.0	10
31	30.34	30.15	30.278	48.0	3 P	18.0	7 A	33.0	34.0	31.0	8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	43.0	.408	70.5	W.S.W.	320	11.0	47	2 P	9:30 A	3:30 P	T	
2	38.0	.363	64.5	W.S.W.	216	5.5	33	1 P				
3	39.5	.361	68 0	W.	118	2.5	22	11 A				
4	37.0	.293	74.0	W.	18	0.0	00	—				
5	48.0	.447	75.0	S.	118	4.5	30	5 P	7:30 P	12 P	T	
6	35.5	.326	65.0	S.	220	4.0	28	6 P	0 A	5 A	.11	
7	25.0	.234	58.5	S.	111	3.5	26	9 A				
8	40.0	.319	81.0	S.	119	4.0	28	10 A	4 P	12 P	T	
9	50.5	.432	86.5	W.S.W.	68	0.0	00	—				
10	54.5	.478	93.5	S.	66	1.5	17	8 P	6 A	2 P	.05	
11	51.5	.509	77.5	S.E.	236	6.5	36	2 P	5 A	1 P	.14	
12	29.5	.228	74.5	S.S.E.	200	2.5	22	12 M	7 A	6 P	.09	T
13	35.0	.258	82.5	N.E.	248	5.5	33	10 A	2 A	8 A	.13	
14	34.5	.287	72.5	N.N.W.	132	5.5	33	12 M	4 P	5 P	T	
15	28.5	.272	58.0	N.N.W.	268	5.0	32	9 A				
16	31.0	.254	66.5	N.W.	32	0.5	10	7 P				
17	34.5	.303	68.0	N.N.W.	3	0.0	00	—				
18	39.5	.362	65.5	S.S.W.	54	1.5	17	12 M				
19	47.0	.383	82.0	E.S.E.	65	1.0	14	3 P				
20	56.5	.490	93.0	S.	13	2.0	20	6 P	7:30 A	10 A	T	
21	52.5	.465	86.0	S.S.E.	340	23.5	69	12 M	4 A	4 P	1.22	
22	34.0	.260	77.0	S.W.	77	4.5	30	2 P				
23	34.5	.292	67.5	W.	60	1.5	17	12 M				
24	29 5	.226	72.5	W.	91	2.0	20	12 M				
25	43.0	.347	81.0	S.	197	4.5	30	1 P				
26	36.0	.268	78 0	W.N.W.	80	4.5	30	4 P	2 P	3 P	T	
27	25.5	.207	68.0	W.N.W.	205	4.0	28	12 M				
28	23.0	.175	73.5	S.	55	0.5	10	10 P				
29	35.0	.273	75 5	S.	188	1.5	17	10 A				
30	23.0	.208	61.0	N.N.W.	305	11.5	48	2 P				
31	27.5	.191	78.0	N.N.W.	37	0.5	10	12 M				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The most noticeable features of the weather during the month pertained to the temperature and precipitation. Early in the month some low minimums were noted and on 15 dates the thermometer fell to the freezing point or lower. The minimum for the month was 2 degrees lower than any previous record for October at this Station. The mean temperature for the month from the maximum and minimum readings was 4 degrees below the normal, and the lowest record since 1895. On the 28th the mean hourly temperature for the day was almost to the freezing point. On the 28th thin ice was formed and on the morning of the 31st there was ice half an inch thick on the college pond. The maximum temperature for the month was nearly normal.

The total precipitation for the month was less than half the usual amount and nearly three-fourths of it fell during a single storm on the 21st. Only a trace of rain was noted during the last ten days of the month. The amount of sunshine during the month was considerably more than usual.

Regarding the other features of the weather for the month but little need be said: The mean barometer was slightly higher than the normal and the range was about 10 per cent greater than usual. The fall of the barometer during the storm of the 21st was very rapid and very high wind was noted; the anemometer recording a hundred miles during three hours. The total wind movement was little more than normal. The mean due point was more than 4 degrees below the normal while the relative humidity was about normal. Snow and hail were noted on the 12th.

G. W. PATCH,
Observer.

J. E. OSTRANDER,
Meteorologist.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 191. NOVEMBER, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.25, 17th, 8 P.
Minimum reduced to freezing,	28.42, 13th, 10 P.
Reduced† maximum reading,	30.57, 17th, 8 P.
Reduced† minimum reading,	28.73, 13th, 10 P.
Mean semi-daily reduced,	29.947
Monthly range,	1.84

****Air Temperature.*** In Degrees Fahr.

Highest,	56.5, 4th, 2 P.
Lowest,	7.5, 29th, 3 A.
Mean hourly,	33.0
Mean of means of max. and min.,	34.0
Mean sensible (wet bulb),	29.4
Monthly range,	49.0
Highest mean daily,	44.7, 4th
Lowest mean daily,	17.1, 28th
Mean maximum,	44.3
Mean minimum,	23.7
Mean daily range,	20.6
Greatest daily range,	33.5, 29th
Least daily range,	6.0, 13th

Humidity.

Mean dew point,	25.1
Mean force of vapor,	.185
Mean relative humidity,	77.5

Precipitation. In inches.

Total precipitation,	1.35
Number of days on which .01 inch or more rain or melted snow fell,	2
Total snow in inches,	2
Snow on ground at end of month,	none

Wind.

Total movement,	3470 m.
Greatest daily movement,	450 m., 14th
Least daily movement,	8 m., 20th
Mean daily movement,	115.7m.
Mean hourly velocity,	4.8m.
Maximum pressure per square foot, 11.5 lbs.= 48m. per hour, 14th, 10 A., N.N.W.	
Prevailing Direction, West.	

Summary.

North, Northwest,	23 per cent.
South,	20 " "
West, Northwest,	17 " "
Northwest,	10 " "
Other directions,	30 " "

Weather.

Mean cloudiness observed,	43 per cent.
Total cloudiness recorded by the Sun Thermometer,	145 hrs.=49 per cent.
Number of clear days,	13
Number of fair days,	6
Number of cloudy days,	11

Bright Sunshine.

Number of hours recorded, 148 hrs.=51%

Rain, 13th, 29th.

Snow, 9th, 13th, 25th, 27th,.

Gales, 35 miles or more per hour, 42m. 13th, N.N.W.: 48m. 14th, N.N.W.; 35m. 16th, N.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.36	30.10	30.191	55.0	3 P	27.5	7 A	41.3	39.5	33.0	3
2	30.48	30.31	30.409	51.5	3 P	21.5	7 A	36.5	36.9	33.7	10
3	30.31	29.93	30.088	54.0	3 P	33.0	2 A	43.5	44.3	41.7	0
4	29.94	29.85	29.894	56.5	2 P	34.0	7:30 A	45.3	44.7	39.3	3
5	29.85	29.62	29.729	49.0	3 P	32.0	12 P	40.5	38.6	33.3	3
6	29.73	29.63	29.707	42.0	3 P	29.0	7:30 A	35.5	34.2	29.5	3
7	29.74	29.66	29.735	40.5	3 P	29.5	7 A	35.0	32.8	29.5	7
8	29.93	29.74	29.875	47.5	3 P	24.0	12 P	35.7	34.2	27.7	9
9	30.06	29.92	29.981	35.5	3 P	21.0	6 A	28.3	28.7	27.7	0
10	30.20	30.06	30.156	50.5	3 P	22.0	7:30 A	36.3	33.5	26.7	9
11	30.12	29.95	30.033	44.0	4 P	26.5	1 A	35.3	31.8	27.7	4
12	30.02	29.64	29.806	52.0	3 P	22.0	7 A	37.0	36.3	31.5	8
13	29.64	28.73	29.222	40.0	9 A	34.0	5 A	37.0	34.6	34.7	0
14	29.95	28.74	29.551	38.5	3 P	32.0	6 A	35.3	34.9	32.0	1
15	30.11	29.95	30.107	49.0	3 P	27.0	7 A	38.0	37.5	32.5	9
16	30.33	30.07	30.189	48.0	2 P	29.5	3 A	37.7	36.5	31.7	3
17	30.57	30.33	30.557	32.5	4 P	19 0	7:30 A	25.7	25.5	18.7	9
18	30.52	30.24	30.371	35.0	4 P	11 0	7:30 A	23.0	20.5	16.0	9
19	30.24	30.03	30.126	46.0	4 P	14.5	7:30 A	30.3	27.0	23.5	9
20	30.03	29.68	29.853	47.5	7 P	20.5	7 A	34.0	33.0	32.0	7
21	30.01	29.64	29 867	46.5	9 A	31.0	12 P	38.7	40.9	37.5	5
22	30.08	29.89	29.986	51.0	3 P	22.0	7 A	36.5	35.1	30.7	8
23	29.98	29.75	29.891	53.0	3 P	28 0	12 P	40.5	38 5	31.0	7
24	29.75	29.49	29.578	45 0	3 P	27.0	12 P	36.0	33.8	32.0	1
25	29.83	29.50	29.668	37.0	3 P	23.5	5 A	30.3	30.8	28.7	0
26	30.05	29.83	30.023	34.0	3 P	17.0	12 P	25.5	27.3	23.7	5
27	30.03	29.84	29.935	30.0	5 P	11.0	7 A	20.5	19.9	19.5	0
28	30.24	29.93	30.143	25.0	2 P	8.0	12 P	16.5	17.1	14.5	7
29	30.24	29.77	29.965	41.0	12 P	7.5	3 A	24.3	23.0	26.3	5
30	29.78	29.68	29.780	51.0	2 P	28.0	12 P	39.5	39.0	39.0	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	32.0	.211	75.5	W.S.W.	90	4.5	30	6 P				
2	30.5	.209	86 0	S.	53	1.0	14	1 P				
3	39.5	.278	88.5	S.	119	1.5	17	1 P				
4	36.5	.262	85.5	E.N.E.	88	1.0	14	12 M				
5	29.0	.208	76.5	N.	118	1.0	14	5 P				
6	23.0	.186	68.5	N.N.W.	76	1.5	17	4 P				
7	23.5	.181	74 0	W.N.W.	184	4.5	30	2 P				
8	21.0	.173	66.5	N.W.	130	2.0	20	9 A				
9	22.5	.168	74.5	W.	42	0 5	10	6 P	12 M	1 P		T
10	22.5	.160	73.5	N.N.W.	25	0.0	—	—				
11	23.0	.166	76.0	N.N.W.	59	1.0	14	5 P				
12	26.0	.203	73.5	S.	126	1.5	17	2 P				
13	32.5	.215	87.5	S.S.E.	202	9 0	42	12 P	8 A	10 P	1.10	2
14	25.0	.208	68.0	N.N.W.	450	11.5	48	10 A				
15	26.0	.212	68.5	W.	123	1.0	14	3 P				
16	26.0	.198	75.0	N.N.W.	125	6.0	35	7 P				
17	10.0	.120	62.5	N.N.W.	280	5.0	32	11 A				
18	12.0	.100	77.5	N.N.W.	69	0.0	—	—				
19	20.5	.135	85.0	N.W.	12	0.0	—	—				
20	28.5	.211	78.5	N.W.	8	0.5	10	5 P				
21	33.5	.254	76.0	W.N.W.	207	4.5	30	10 A				
22	26.5	.186	77.0	S.	57	0.5	10	7 P				
23	30.5	.187	92.5	W.	62	0.5	10	2 P				
24	27.5	.191	78.5	S.	91	0.5	10	8 A				
25	23.5	.175	75.5	W.N.W.	114	3.0	24	11 A	8 A	10 A		T
26	20.0	.141	77.0	W.N.W.	215	5.5	33	12 M				
27	17.5	.113	89.0	W.N.W.	35	0.5	10	3 P	11 A	3 P		T
28	10.5	.095	78.0	S.S.W.	139	3.0	24	11 P				
29	24.5	.173	81.0	S.S.E.	35	1.0	14	12 P	6 P	11 P	.25	
30	30.0	.222	78.0	S.	136	0.5	10	7 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during November was more pleasant than usual for the time of year although the month's temperature record was low. Departures from the normal were quite pronounced for several of the weather elements and the minimum barometer made a new low record for the month at this station.

A comparison of the records for the month with the normals shows the following as the more important features: The mean barometer was unusually low and the range for the month almost equal to the average annual range for the station. A rapid fall of the barometer during the storm of the 13th resulted in the minimum for the month —a record that has been equaled at this station but a few times during sixteen years. The recovery after the storm was almost as rapid as the fall.

The mean temperature for the month was about four degrees below the normal and the maximum about ten degrees lower than usual. The minimum was about three degrees lower than the average November minimum. The mean dew point was more than six degrees below the normal while the relative humidity was practically normal.

The total precipitation was less than 40 per cent of the normal amount and all of it occurred on two dates. The percentage of sunshine was large and the cloudiness observed in the evening was less than half the amount observed in the morning,—an unusual record here.

The total wind movement was about 80 per cent of the normal, much of it coming from the northwest quadrant. The record of 450 miles on the 14th is exceptional for this section.

J. E. OSTRANDER Meteorologist.

G. W. PATCH. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 192. DECEMBER, 1904.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.22, 26th, 11 A.
Minimum reduced to freezing, 28.80, 28th, 1 P.
Reduced† maximum reading, 30.54, 26th, 11 A.
Reduced† minimum reading, 29.11, 28th, 1 P.
Mean semi-daily reduced, ... 30.021
Monthly range, ... 1.43

****Air Temperature.*** In Degrees Fahr.

Highest, ... 43.5, 23d, 5 P.
Lowest, ... -3.5, 15th, 7.30 A.
Mean hourly, ... 19.6
Mean of means of max. and min., ... 19.4
Mean sensible (wet bulb), ... 17.4
Monthly range, ... 47.0
Highest mean daily, ... 36.0, 23d
Lowest mean daily, ... 5.3, 15th
Mean maximum, ... 28.3
Mean minimum, ... 10.5
Mean daily range, ... 17.8
Greatest daily range, ... 32.0, 24th
Least daily range, ... 7.5, 3d

Humidity.

Mean dew point, ... 12.6
Mean force of vapor, ...112
Mean relative humidity, ... 77.8

Precipitation. In inches.

Total precipitation, ... 2.75
Number of days on which .01 inch or more rain or melted snow fell, ... 8
Total snow in inches, ... 11
Snow on ground at end of month, ... 2

Wind.

Total movement, ... 3940 m.
Greatest daily movement, . . . 340 m., 24th
Least daily movement, ... 8 m., 17th
Mean daily movement, ... 127m.
Mean hourly velocity, ... 5.3m.
Maximum pressure per square foot, 9.5 lbs.= 44m. per hour, 29th, 3 P., W.S.W.
Prevailing Direction, Northwest.

Summary.

North, Northwest, ... 16 per cent.
South, ... 10 " "
North . . . . . 29 " "
Northwest, ... 13 " "
Other directions, ... 32 " "

Weather.

Mean cloudiness observed, ... 57 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 168 hrs.=59 per cent.
Number of clear days, ... 7
Number of fair days, ... 8
Number of cloudy days, ... 16

Bright Sunshine.

Number of hours recorded, . . . 115 hrs.=41%
Rain, 23d, 25th, 26th, 27th, 28th.
Snow, 4th, 5th, 8th, 13th, 18th, 19th, 20th, 21st, 25th, 26th, 27th, 30th.
Gales, 35 miles or more per hour, 36m. 24th. N.N.E.; 38m. 28th, W.; 44m.29th, W.S.W.
Days of Sleighing, ... 6

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean, Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.01	29.76	29.910	35.5	3 P	26.0	7:30 A	30.7	30.5	26.5	5
2	30.42	30.01	30.259	30.5	2 P	16.0	12 P	23.3	25.6	21.7	7
3	30.43	30.28	30.409	20.0	3 P	12.5	12 P	16.3	16.4	13.7	0
4	30.32	30.14	30.260	27.0	4 P	6.0	7:30 A	16.5	15.4	10.5	5
5	30.34	29.92	30.132	26.5	5 P	6.5	7:30 A	16.5	16.9	16.5	0
6	30.08	29.91	30.039	31.0	4 P	9.0	5 A	20.0	20.3	17.5	8
7	29.96	29.55	29.661	35.5	4 P	14.0	3 A	24.7	24.4	23.0	1
8	29.61	29.31	29.490	26.5	4 P	13.0	12 P	19.7	21.3	19.5	0
9	30.03	29.61	29.912	20.5	2 P	5.0	12 P	12.7	15.1	12.0	8
10	30.05	29.88	29.991	12.0	6 P	0.0	6 A	6.0	7.4	6.7	0
11	30.19	29.93	30.144	20.5	4 P	1.5	7:30 A	11.0	9.6	5.0	8
12	30.19	29.84	29.998	24.5	5 P	4.5	7:30 A	14.5	13.5	13.7	0
13	30.15	29.84	29.973	28.5	4 P	9.5	12 P	19.0	19.8	17.3	6
14	30.41	30.15	30.309	19.5	4 P	-1.5	7:30 A	9.0	7.4	4.0	8
15	30.47	30.17	30.350	17.5	4 P	-3.5	7:30 A	7.0	5.3	4.0	4
16	30.17	29.96	30.047	33.5	5 P	8.0	12 P	20.7	18.4	15.5	6
17	30.19	29.87	30.098	21.0	3 P	-2.0	8 A	9.5	11.5	7.8	7
18	30.01	29.71	29.883	32.0	4 P	7.0	12 P	19.5	21.4	17.8	5
19	30.04	29.78	29.918	29.0	6 P	0 0	6 A	14.5	14.2	16.0	2
20	29.89	29.68	29.802	32.0	3 P	19.5	3 A	25.8	26.7	25.3	2
21	30.30	29.66	30.043	28.0	1 P	10.0	12 P	19.0	20.0	16.3	8
22	30.31	30.15	30.254	31.0	4 P	5.0	4 A	18.0	19.1	19.5	5
23	30.15	29.78	29.879	43.5	5 P	28.0	1 A	35.8	36 0	35.0	3
24	30 42	29.78	30.169	41.0	3 A	9.0	12 P	25.0	24.1	19.0	0
25	30.52	30.42	30.501	14.0	8 P	2.5	8 A	8.3	8.3	6.7	4
26	30.54	30.39	30.483	22.0	6 P	11.0	2 A	16.5	16.7	17.5	0
27	30.39	29.50	29.824	33.0	6 P	20.5	1 A	26 7	27.6	29.5	0
28	29.50	29.11	29.284	39.5	1 P	29.0	12 P	34.3	30.8	27.7	3
29	29.93	29.47	29.831	29.5	3 P	21.0	6 A	25.3	24.5	20.7	3
30	30.06	29.93	30.029	31.0	3 P	19.5	12 P	25.3	25.0	22.0	5
31	29.96	29.60	29.762	41.0	4 P	18.5	1 A	29.7	32.0	30.0	2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	22.0	.158	78.0	W.	120	4.5	30	2 P				
2	16.0	.136	70 5	W.N.W.	76	3.5	26	7 A				
3	4.5	.095	60.5	N.N.W.	181	0.5	10	12 M				
4	5.0	.078	75.0	N.W.	35	1.5	17	4 P	3 P	7:30 P		T
5	15.0	.101	91.0	N.N.E.	19	0.0	—	—	4:30 P	9:30 P	.18	2½
6	16.5	.100	97.0	N.W.	49	1.5	17	12 M				
7	17.5	.139	71.0	S.	120	4.0	28	8 P				
8	17.0	.111	86.0	S.W.	76	0.0	—	—	5 A	5 P	.07	1
9	−5.0	.088	44.0	N.W.	128	1.5	17	6 A				
10	−7.5	.069	45.0	N.	173	4.0	28	11 P				
11	−0.5	.060	72.0	N.N.W.	146	2.0	20	2 P				
12	12.0	.090	88.5	N.W.	51	0.5	10	1 P	3 P	12 P	*	*
13	13.0	.102	81.0	N.	246	1.5	17	3 P	0 A	1 P	.47	3
14	0.0	.058	80.0	N.N.W.	114	2.0	20	3 P				
15	−1.0	.049	80.0	N.	46	0.0	—	—				
16	9.0	.099	70.5	N.	112	2.0	20	11 A				
17	1.0	.075	70.0	N.	8	0.0	—	—				
18	15.5	.103	88.5	N.N.W.	187	5.0	32	9 A	0 A	9:30A	.11	1½
19	14.5	.103	91.5	S.S.W.	28	0.0	—	—	9 A	10:30A		T
20	23.0	.144	85.5	S.W.	174	2.5	22	10 A	5 P	8 P		T
21	13.5	.100	84.0	N.N.W.	173	2.0	20	11 A	7 A	8 A		T
22	16.5	.120	83.5	S.	122	1.5	17	10 P				
23	32.0	.220	83.0	S.	176	1.0	14	11 P	10:30A	11 A	T.	
24	9.5	.125	58.0	N.	340	6.5	36	8 A				
25	2.0	.067	73.0	N.	180	4.0	28	7 A	6 P	12 P	*	*
26	17.5	.100	100.0	N.	79	0.0	—	—	0 A	12 P	*	*
27	28.5	.165	97.0	N.	34	0.0	—	—	0 A	12 P	*	3
28	24.5	.164	82.5	W.S.W.	147	7.0	38	9 P	0 A	11 A	1.92	
29	14.0	.127	66.0	W.S.W.	335	9.5	44	3 P				
30	20.0	.123	90.0	S.S.W.	201	4.0	28	5 A	8 A			T
31	24.5	.195	70.0	S.S.E.	64	0.5	10	8 P				

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1904.

Pressure. In inches.

Maximum reduced to freezing, ... 30.63, Mar. 5, 10 A.
Minimum reduced to freezing, ... 28.42, Nov. 13th, 10 P.
Maximum reduced to freezing and sea-level, ... 30.96, Mar. 5, 10 A.
Minimum reduced to freezing and sea-level, ... 28.73, Nov. 13th, 10 P.
Mean reduced to freezing and sea-level, ... 30.034
Annual range, ... 2.23

****Air Temperature.*** In degrees Fahr.

Highest, ... 94.5, July 19th, 3 P.
Lowest, ... —26.0, Jan. 5th, 7:30 A.
Mean, ... 43.9
Mean of means of max. and min., ... 44.0
Mean sensible (wet bulb), ... 39.5
Annual range, ... 120.5
Highest mean daily, ... 79.5, June 26th.
Lowest mean daily, ... —12.7, Jan. 5th.
Mean maximum, ... 54.9
Mean minimum, ... 33.1
Mean daily range, ... 21.8
Greatest daily range, ... 49.0, Oct. 17th
Least daily range, ... 3.5, March 22d.

Humidity.

Mean dew point, ... 35.5
Mean force of vapor, ...354
Mean relative humidity, ... 77.0

Wind.

Prevailing direction, ... West

Summary.

South, ... 20 per cent.
Northwest, ... 12 " "
North, Northwest, ... 12 " "
North, ... 10 " "
West, ... 10 " "
Other directions, ... 36 " "
Total movement, ... 46,994 m.
Greatest daily movement, . . . 450 m., Nov. 14th.
Least daily movement, ... 0 m., Jan. 6th.
Mean daily movement, ... 128 m.
Mean hourly velocity, ... 5.3 m.

*Temperature in ground shelter.

Maximum pressure per square foot, 23.5 lbs.=69 m. per hour, Feb. 8th, 2 A., W.N.W., Oct. 21st, 12 M., S.S.E.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 45.30
Number of days on which .01 or more rain or melted snow fell, ... 126
Snow total in inches, ... 59½

Weather.

Mean cloudiness observed, ... 51 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2053 hrs.=46 per cent.
Number of clear days, ... 142
Number of fair days, ... 96
Number of cloudy days, ... 128

Bright Sunshine.

Number of hours recorded, 2401 hrs.=54 per cent.

Dates of Frosts.

Last, ... Apr. 23d
First, ... Sept. 22d

Dates of Snow.

Last, ... Apr. 20th
First, ... Oct. 12th
Total days of sleighing, ... 85

Gales of 50 or More Miles Per Hour.

Feb. 8, 69 m., W.N.W.
Mar. 3, 54 m., N.W.
Apr. 2, 56 m., N.E.
Sept. 30, 54 m., W.N.W.
Oct. 21, 69 m., S.S.E.

G. W. PATCH,
Observer.

J. E. OSTRANDER,
Meteorologist.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No 193. JANUARY, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.38, 11th, 10 A.
Minimum reduced to freezing,	29.03, 7th, 3 P.
Reduced† maximum reading,	30.70, 11th, 10 A.
Reduced† minimum reading,	29.33, 7th, 3 P.
Mean semi-daily reduced,	30.084
Monthly range,	1.37

****Air Temperature.*** In Degrees Fahr.

Highest,	51.0. 7th, 4 P.
Lowest,	-13.0, 24th. 7.30 A.
Mean hourly,	20.4
Mean of means of max. and min.,	20.6
Mean sensible (wet bulb),	14.0
Monthly range,	64 0
Highest mean daily,	41.4, 1st
Lowest mean daily,	1.7, 5th
Mean maximum,	29.1
Mean minimum,	12.0
Mean daily range,	17.1
Greatest daily range,	30.5, 24th
Least daily range,	5.5, 2d

Humidity.

Mean dew point,	12.8
Mean force of vapor,	.118
Mean relative humidity,	77.2

Precipitation. In inches.

Total precipitation,	3.90
Number of days on which .01 inch or more rain or melted snow fell,	11
Total snow in inches,	21
Snow on ground at end of month,	8

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5180 m.
Greatest daily movement,	475 m., 4th
Least daily movement,	4 m., 21st
Mean daily movement,	167m.
Mean hourly velocity,	7.0m.
Maximum pressure per square foot, 23.5 lbs.= 69 m. per hour, 4th, 9 A., N.N.W.	
Prevailing Direction, West.	

Summary.

North, Northwest,	23 per cent.
West, Northwest,	19 " "
West, Southwest,	13 " "
Southwest,	10 " "
South,	10 " "
Other directions,	25 " "

Weather.

Mean cloudiness observed,	58 per cent.
Total cloudiness recorded by the Sun Thermometer,	175 hrs.=59 per cent.
Number of clear days,	7
Number of fair days,	9
Number of cloudy days,	15

Bright Sunshine.

Number of hours recorded,	119 hrs.=41%

Rain, 2d, 7th, 11th, 12th, 19th.

Snow, 3d, 4th, 6th, 8th, 10th, 11th, 17th, 21st, 22d, 24th, 25th, 28th.

Gales, 35 miles or more per hour, 44m. 3d. N.N.W.; 69m. 4th, N.N.W.; 52m. 7th, E. S.E.; 37m. 8th, S.W.; 36m. 10th, W.; 36m. 12th. W.; 41m. 16th, S.; 41m. 19th, S.; 60m. 25th, N.N.W.; 50m. 26th. N. W.

Days of Sleighing, 28

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourl Draper.	Mean Sensible Wet Bulb.	
1	29.88	29.61	29.795	50.0	4 P	32.0	12 P	41.0	41.4	36.7	6
2	29.85	29.65	29.710	37.0	4 P	31.5	1 A	34.3	34.5	33.5	0
3	29.71	29.59	29.675	34.5	0 A	12.0	12 P	23.3	22.4	20.3	0
4	30.02	29.48	29.698	12.0	0 A	0.0	12 P	6.0	7.5	4.0	1
5	30.60	30.02	30 444	11.0	5 P	−4.0	7:30 A	3.5	1.7	−0.5	7
6	30.63	30.05	30.428	29.0	12 P	−0.5	1 A	14.3	10.0	11.5	0
7	30.05	29.33	29.443	51.0	4 P	28.0	0 A	39.5	41.2	40.3	4
8	30.18	29.49	29.860	32.0	1 P	25.0	12 P	28.5	28.6	25.3	3
9	30.64	30.18	30.523	32.0	3 P	17.0	7:30 A	24.5	26.0	22.0	9
10	30.56	30.30	30.411	33.5	12:30 P	18.5	12 P	26.0	26.0	22.5	6
11	30.70	30.54	30.634	27.0	3 P	20.5	12	23.7	21.2	19.5	4
12	30.54	29.84	29.980	38.0	11:30 P	21.0	2 A	29.5	28.2	28.3	0
13	30.27	29.87	30.209	37.0	0 A	13.0	12 P	25.0	22.8	18.3	8
14	30.34	30.19	30.309	18.0	1 P	11.0	7:30 A	14.5	12.6	8.7	8
15	30.36	30.10	30.243	19.5	4 P	0.5	7:30 A	10.0	11.7	8.3	4
16	30.10	29.97	30.014	29.5	4 P	17.0	0 A	23.3	22.0	17.7	8
17	30.04	29.97	30.000	32.5	4 P	17.5	2 A	25.0	26.7	23.5	1
18	30.18	30.03	30.115	35.5	1 P	26 0	11 P	30.7	30.2	27.5	1
19	30.06	29.66	29.713	46.5	3 P	27 0	0 A	36.7	37.0	33.5	2
20	30.03	29.67	29.940	38.5	2 P	22.5	12 P	30.5	33.6	27.5	5
21	30.23	30.03	30.159	30.0	3:30 P	15.5	7 A	22.7	23.3	22.0	1
22	30.16	29.97	30.039	35.0	3 P	17.0	12 P	26.0	27.4	24.0	1
23	30.33	30.16	30.298	18.5	4 P	−9.5	7:30 A	4.5	6.3	−0.7	9
24	30.31	29.95	30.128	17.5	6 P	−13.0	7:30 A	2.3	4 0	2.0	5
25	29.95	29.60	29.668	12.0	2 P	5.5	12 P	8.7	9.0	7.5	0
26	30.11	29.68	29.892	16.5	3 P	2.5	6 A	9.5	8.1	3.7	3
27	30.14	30.00	30.071	23.0	3 P	2.0	7 A	12 5	13.6	12.3	4
28	30.16	29.91	29.986	26 0	4 P	11.0	12 P	18.5	19.3	16.0	2
29	30.40	30.16	30.333	28.5	3:30 P	0.5	7:30 A	14.5	12.6	6.3	9
30	30.52	30.37	30.460	25.0	3 P	8.0	12 P	16.5	14.7	11.3	4
31	30.55	30.36	30 434	26.5	3 P	−2.5	7:30 A	12.0	9.2	5.7	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	33.5	.240	80.0	S.	108	3.0	24	12 M				
2	32.0	.197	92 5	W.N.W.	42	0.0	—	—	11 A	12 P	.14	
3	19.0	.117	93.5	N.N.W.	338	9.5	44	11 A	0 A	12 P	*	*
4	−2.5	.059	69.0	N.N.W.	475	23.5	69	9 A	0 A	12 M	.74	6
5	−2.5	.046	85.5	N.	60	0.0	—	—				
6	9 0	.082	85.5	N.N.W.	120	0.0	—	—	3 A	12 P	*	4
7	36.5	.282	79.5	S.S.E.	444	13.5	52	2 A	0 A	12 M	1.15	
8	22.0	.147	80.5	W.S.W.	236	7.0	37	12 M	5 P	6 P		T
9	18.5	.128	81.5	S.	180	3.0	24	7 P				
10	20.5	.128	90.0	S.	208	6.5	36	11 A	10 A	11 A		T
11	16 0	.114	82.5	W.	59	0.5	10	8 P	9 P	12 P	*	½
12	27.5	.156	97.5	W.S.W.	14	6.5	36	11 P	0 A	3 P	.92	
13	16.0	.107	82.5	W.S.W.	213	4.0	28	1 A				
14	2.5	.072	69.5	N.W.	108	4.0	28	1 P				
15	−0.5	.074	63.0	W.N.W.	77	2.5	22	3 P				
16	11.5	.108	70.5	S.S.W.	181	8.5	41	12 M				
17	17.0	.146	66.0	S.W.	160	4.5	30	12 M	8 A	10 A		T
18	24.0	.162	81.0	S.W.	109	2.0	20	5 A				
19	28.0	.217	70.0	W.S.W.	303	8.5	41	11 P	10 A	11 A	T.	
20	20.5	.173	65.0	W.N.W.	185	3.0	24	3 A				
21	18 5	.125	83.0	W.N.W.	4	0.5	10	5 P	2 P	12 P	*	*
22	21.0	.138	84.0	N.N.W.	50	3.5	26	11 P	0 A	2 P	.42	4½
23	−4.5	.046	81.0	S.W.	90	0.0	—	—				
24	−1.5	.059	83.0	W.N.W.	39	0.0	—	—	6 P	12 P	*	*
25	−0.5	.068	69 5	N.N.W.	460	18.0	60	4 P	0 A	10 P	.53	6
26	−8.5	.060	51.0	N.N.W.	470	12.5	50	10 A				
27	5.5	.088	67.0	S.S.W.	141	2.0	20	5 P				
28	8.5	.102	66 0	W.N.W	145	1.0	14	3 P	10 A	1:30 P		T
29	1.0	.065	74.0	N.N.W.	23	0.0	—	—				
30	7.5	.081	78.5	N.W.	82	2.5	22	1 P				
31	0.0	.063	72 0	N.	56	0.5	10	12 M				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather for the month was colder than usual and high winds were prevalent. The number of gales was unusual even for this season of the year. The amount of cloudiness was large and the snow fall more that the normal amount.

A comparison of the records with those of previous years shows the following features : The mean barometer was slightly more than the normal and the range was considerably less than usual. Some of the fluctuations while large were not unusual for the season.

The mean temperature was about two and one-half degrees lower than the normal and zero weather was noted at three different periods ; the 4th–6th, the 23d–24th and the 31st. The maximum for the month was about normal while the minimum was low, giving a large range for the month. The month was more than six degrees warmer than the very low record of January last year. The mean dew point was nearly six degrees lower than usual while the relative humidity was about normal.

The total precipitation was slightly more than usual, much of it occurring as snow. The storms on the 3d–4th and 24th–25th were accompanied by very high winds, causing the snow to drift badly and blockading the electric roads more or less completely in this section. The total wind movement was about 15 per cent more than the normal. On four dates the daily record exceeded 400 miles which is exceptional here. Most of the high winds were from the northwest quadrant.

J. E. OSTRANDER Meteorologist.

G. W. PATCH Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 194. FEBRUARY, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.30, 19th, 8 P.
Minimum reduced to freezing,	29.03, 13th, 9 A.
Reduced† maximum reading,	30.62, 19th, 8 P.
Reduced† minimum reading,	29.34, 13th, 9 A.
Mean semi-daily reduced,	30.119
Monthly range,	1.28

****Air Temperature.*** In Degrees Fahr.

Highest,	48.5, 21st, 5 P.
Lowest,	-11.0, 4th, 7.30 A.
Mean hourly,	17.7
Mean of means of max. and min.,	17.6
Mean sensible (wet bulb),	14.5
Monthly range,	59.5
Highest mean daily,	30.5, 24th
Lowest mean daily,	4.2, 4th
Mean maximum,	28.2
Mean minimum,	6.9
Mean daily range,	21.3
Greatest daily range,	34.5, 21st
Least daily range,	5.5, 22d

Humidity.

Mean dew point,	9.2
Mean force of vapor,	.100
Mean relative humidity,	75.1

Precipitation. In inches.

Total precipitation,	1.70
Number of days on which .01 inch or more rain or melted snow fell,	5
Total snow in inches,	11
Snow on ground at end of month,	4

Wind.

Total movement,	4503 m.
Greatest daily movement,	333 m., 18th
Least daily movement,	6 m., 12th
Mean daily movement,	161m.
Mean hourly velocity,	6.7m.

Maximum pressure per square foot, 18.0 lbs.= 60 m. per hour, 18th, 12 M., W.

Prevailing Direction, West, Northwest.

Summary.

West, Northwest,	32 per cent.
North,	14 " "
North, Northwest,	11 " "
West,	11 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	31 per cent.
Total cloudiness recorded by the Sun Thermometer,	118 hrs.=40 per cent.
Number of clear days,	14
Number of fair days,	6
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded, . . . 178 hrs.=60%

Rain, 9th, 10th, 13th.

Sleet, 6th; 12th.

Snow, 6th, 9th, 12th, 13th, 20th, 28th.

Gales, 35 miles or more per hour, 36m. 7th, N.W.; 41m. 10th, W.; 60m. 18th, W.; 39 m. 27th, W.N.W.

Days of Sleighing, ... 28

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.36	30.06	30.211	24.0	4 P	−6.5	7:30 A	8.7	11.8	7.5	7
2	30.06	29.97	30.019	19.5	2 P	8.0	12 P	13.7	14.1	10.7	6
3	30.38	30.06	30.257	16.5	3 P	1.5	7:30 A	9.0	8.2	2.7	10
4	30.50	30.38	30.453	19.0	4 P	−11.0	7:30 A	4.0	4.2	−1.3	9
5	30.59	30.41	30 499	23.5	4 P	−3.5	6 A	10.0	11.5	8.7	7
6	30.41	29.89	30.044	27.0	5 P	13.0	5 A	20.0	21.2	21.5	0
7	30.31	29.91	30.081	27.5	4 A	9.0	12 P	18.3	18.4	12.3	7
8	30.48	30.31	30.398	29.0	3:30 P	2.5	7:30 A	15.7	14.8	9.3	10
9	30.33	29.88	30.056	32.0	11 P	11.0	7 A	21.5	22.1	22.7	0
10	30.02	29.77	29.839	32.0	2 P	24.0	12 P	28.0	30.4	27.3	5
11	30.48	30.02	30.365	24.0	3 P	8.5	12 P	16.3	17.4	10.3	10
12	30.48	29.50	30.139	21.0	12 P	−7.5	7:30 A	6.7	7.5	5.7	0
13	29.75	29.34	29.483	31.0	12 M	7.0	12 P	19.0	22.2	18.5	0
14	30.12	29.75	30.103	17.0	4 P	−2.5	7:30 A	7.3	6.7	2.0	9
15	30.12	29.96	30.041	22.0	4 P	1.0	7:30 A	11.5	9.9	6.3	9
16	30.33	30.10	30.280	23.0	4 P	−1.0	7:30 A	11.0	9.8	5.0	10
17	30.21	29.84	29.950	30.0	4:30 P	11.0	0 A	20.5	21.0	19.0	3
18	30.43	29.86	30.194	25.0	2 A	10.0	12 P	17.5	16.1	13.5	10
19	30.62	30.43	30.612	21.5	5 P	−5 0	7:30 A	8.3	11.7	7.7	10
20	30.60	30.18	30.339	32.0	4 P	5.0	6 A	18.5	21.9	22.5	0
21	30.38	30.16	30.272	48.5	5 P	14.0	4 A	31.3	29.6	25.2	9
22	30.43	30.29	30.381	26.5	0 A	21.0	12 P	23.7	23.7	21.5	0
23	30.29	30.07	30.143	35.5	6 P	16.5	7:30 A	26.0	24.6	21.0	8
24	30.10	29.96	30.024	40.0	6 P	22.5	0 A	31.3	30 5	26.3	9
25	29.96	29.71	29.787	40.5	4:30 P	10.5	7 A	25.5	25.2	20.0	10
26	29.75	29.63	29.704	40.0	4 P	8.5	7:30 A	24.3	24.0	19.0	7
27	29.92	29.69	29.853	26.5	5 P	15.0	2 A	20.7	20.9	19.5	9
28	29.92	29.71	29.821	35.5	3 P	11.5	7:30 A	23.5	22.7	20.3	4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	3.0	.076	79.5	S.W.	24	0.0	—	—				
2	3.5	.080	66.5	W.	160	5.0	32	7 P				
3	-6.5	.055	62.0	N.W.	220	2.5	22	3 P				
4	-9.5	.048	64.5	N.N.W.	80	1.0	14	6 P				
5	-1.0	.075	60.0	N.N.W.	148	5.5	33	10 A				
6	20.5	.122	94.0	N.N.W.	156	1.5	17	2 P	2 A	8 P	.68	5
7	7.0	.085	71.5	W.N.W.	248	6.5	36	11 A				
8	0.0	.077	58.5	N.	210	5.5	33	11 A				
9	22.0	.132	96.5	W.N.W	22	0.5	10	10 A	1 A	12 P	*	3.5
10	24.5	.157	86.5	W.	156	8.5	41	1 P	0 A	6 A	.54	
11	0.0	.080	56.0	W.N.W.	285	5.5	33	8 A				
12	4.0	.064	90.0	W.N.W.	6	0.0	—	—	1 P	12 P	*	*
13	13.0	.116	75.5	W.N.W.	110	5.5	33	9 P	0 A	3:30 P	.48	2.5
14	-4.0	.053	69.0	W.S.W.	177	3.5	26	11 A				
15	1.5	.066	76.5	S.S.E.	111	1.0	14	2 A				
16	0.0	.062	75.5	W.N.W.	136	1.5	17	12 M				
17	13.0	.118	69.5	S.	258	4.5	30	7 A				
18	10.0	.088	80.0	W.N.W.	333	18.0	60	12 M				
19	0.0	.073	63.5	W.	158	2.0	20	3 P				
20	20.0	.132	87.0	S.	182	2.0	20	1 P	11 A	4 P		T
21	21.0	.155	74.5	S.E.	83	1.0	14	3 P				
22	18.0	.125	80.5	N.N.E.	169	1.5	17	10 P				
23	15.0	.127	69.0	N.	270	4.5	30	11 A				
24	20.5	.157	74.5	N.	235	4.0	28	1 P				
25	12.5	.131	65.0	N.	72	0.0	—	—				
26	16.5	.115	85.0	W.N.W.	111	4.0	28	4 P				
27	15.5	.114	81.0	W.N.W.	316	7.5	39	8 A				
28	18.5	.118	91.0	S.S.E.	67	3.0	24	6 P	3:30 P			T

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The past month proved to be one of the coldest since the establishment of this station. The mean temperature was lower than any previous records excepting January 1893 and January and February 1904. During the first twenty days the temperature never rose above the freezing point and on seven dates the minimum fell below zero. The small precipitation and large amount of sunshine were also prominent features of the weather.

The mean barometer was more than a tenth of one inch above the normal; a high barometer with large fluctuations being especially prominent during the first half of the month. During the storm of the 12th-13th the barometer fell an inch in about 18 hours. The maximum reading for the month was normal and the range was about four-fifths the usual amount.

The maximum and the minimum temperatures were both nearly three degrees below the normal and the mean temperature was about six and one-half degrees lower than usual; the record very nearly equalling the low figure of February last year. The mean dew point was nine degrees below the normal and the relative humidity two and one-half per cent lower than usual.

The total precipitation was about one-half the normal amount and the greater part occurred as snow. The number of clear or fair days was unusually large.

The total wind movement was about 90 per cent of the usual amount, and West Northwest was the predominating direction. Good sleighing continued without interruption throughout the month.

J. E. OSTRANDER Meteorologist.

G. W. PATCH Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 195. MARCH, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.28, 15th, 10 A.
Minimum reduced to freezing,	29.40, 10th, 5 A.
Reduced† maximum reading,	30.60, 15th, 10 A.
Reduced† minimum reading,	29.71, 10th, 5 A.
Mean semi-daily reduced,	30.118
Monthly range,	0.89

****Air Temperature.*** In Degrees Fahr.

Highest,	77.0, 29th, 4:30 P.
Lowest,	1.0, 3d, 7.30 A.
Mean hourly,	33.1
Mean of means of max. and min.,	32.8
Mean sensible (wet bulb),	29.4
Monthly range,	76.0
Highest mean daily,	52.2, 29th
Lowest mean daily,	18.2, 5th
Mean maximum,	44.0
Mean minimum,	21.5
Mean daily range,	22.5
Greatest daily range,	43.0, 29th
Least daily range,	5.0, 8th, 20th

Humidity.

Mean dew point,	24.8
Mean force of vapor,	.195
Mean relative humidity,	76.7

Precipitation. In inches.

Total precipitation,	3.66
Number of days on which .01 inch or more rain or melted snow fell,	12
Total snow in inches,	5½
Snow on ground at end of month,	none

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3006 m.
Greatest daily movement,	240 m., 19th
Least daily movement,	18 m., 29th
Mean daily movement,	97m.
Mean hourly velocity,	4.0m.

Maximum pressure per square foot, 16.5 lbs.= 57 m. per hour, 19th, 3 P., N.E.

Prevailing Direction, West.

Summary.

West, Northwest,	23 per cent.
North,	13 " "
Northwest,	10 " "
South,	23 " "
South, Southwest,	10 " "
Other directions,	21 " "

Weather.

Mean cloudiness observed,	46 per cent.
Total cloudiness recorded by the Sun Thermometer,	155 hrs.=42 per cent.
Number of clear days,	13
Number of fair days,	10
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded, 216 hrs.=58%

Rain, 7th, 8th, 9th, 10th, 19th, 20th, 24th, 25th, 26th, 27th, 30th.

Hail, 9th, 20th.

Snow, 4th, 7th, 21st.

Gales, 35 miles or more per hour, 36m. 4th, N.N.W.; 57m. 19th, N.E.; 35m. 31st, N.N.W.

Days of Sleighing, 6

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.98	29.88	29.954	29.5	3 P	12.0	7:30 A	20.7	21.4	14.0	6
2	30.01	29.89	29.967	33.5	3 P	3.0	7:30 A	18.3	18.8	14.3	10
3	29.97	29.81	29.912	39.0	3 P	1.0	7:30 A	20.0	22.7	15.5	9
4	30.16	29.73	29.901	36.5	12 M	11.0	12 P	23.7	26.5	20.7	5
5	30.25	30.06	30.164	30.0	4 P	3.5	6 A	16.7	18.2	16.3	5
6	30.54	30.10	30.379	34.0	4 P	14.5	7 A	24.3	23.8	18.3	10
7	30.56	30.17	30.419	33.0	5 P	4.0	7 A	18.5	21.4	19.5	5
8	30.17	29.81	29.903	35.0	3 P	30.0	5 A	32.5	32.7	32.7	0
9	30.08	29.83	29.993	43.0	3 P	24.0	7 A	33.5	35.0	30.7	8
10	29.96	29.71	29.771	46.5	3 P	30.0	12 P	38.3	36.9	33.0	6
11	30.39	29.96	30.294	31.5	4 P	18.0	7 A	24.7	26.7	20.5	11
12	30.39	30.25	30.338	38.5	2:30 P	17.0	7 A	27.7	27.3	24.0	11
13	30.47	30.32	30.405	36.5	4:30 P	11.0	7 A	23.7	23.4	19.5	11
14	30.47	30.33	30.395	37.0	4:30 P	16.0	5:30 A	26.5	24.7	20.7	11
15	30.60	30.45	30.529	39.0	4 P	10.0	7 A	24.5	25.0	22.5	11
16	30.45	30.22	30.321	37.0	4 P	10.5	7 A	23.7	26.4	25.5	3
17	30.31	30.12	30.232	44.0	4 P	20.0	7 A	32.0	31.7	27.7	11
18	30.12	29.77	29.896	58.0	4 P	27.5	7 A	42.7	42.1	37.7	8
19	30.00	29.72	29.848	52.0	1 P	36.0	12 P	44.0	43.1	40.7	2
20	30.22	30.00	30.147	36.0	0 A	31.0	8 A	33.5	32.1	31.3	0
21	30.22	30.02	30.101	34.0	9 A	25.0	12 P	29.5	30.2	29.7	0
22	30.34	30.02	30.225	44.5	5:30 P	25.0	0 A	34.7	32.6	30.0	7
23	30.42	30.33	30.382	49.0	1 P	19.5	7 A	34.3	33.9	30.3	8
24	30.35	30.02	30.214	38.5	6 P	29.5	4 A	34.0	33.5	34.0	0
25	30.02	29.81	29.864	43.5	5 P	33.0	5 A	38.3	38.7	39.3	0
26	30.00	29.82	29.926	60.5	3:30 P	31.0	6:30 A	45.7	47.3	43.7	7
27	29.92	29.74	29.814	53.5	5 P	39.0	6 A	46.3	45.3	42.7	3
28	30.06	29.92	30.031	65.0	5 P	34.5	6:30 A	49.7	50.7	44.7	12
29	30.15	30.06	30.117	77.0	4:30 P	34.0	6 A	55.5	52.2	43.7	12
30	30.14	29.94	30.065	66.0	5 P	32.0	6 A	49.0	48.3	44.3	12
31	30.18	30.10	30.139	64.0	3:30 P	36.0	5:30 A	50.0	52.1	44.5	12

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	5.5	.095	62.0	W.N.W.	112	1.5	17	2 P				
2	7.0	.095	66 5	W.N.W.	62	2.5	22	5 P				
3	12.0	.102	83.0	W.N.W.	28	1.0	14	3 P				
4	14.5	.125	74.0	N.N.W.	150	6.5	36	4 P	6:30 A	1 P		T
5	10.5	.104	72.0	S.	130	3.0	24	4 P				
6	9.5	.119	57.5	S.S.W.	123	3.5	26	12 M				
7	16.0	.125	81.0	S.	56	1.5	17	6 P	5:30 P	12 P	*	½
8	31.5	.188	95.0	S.	48	0.5	10	9 A	0 A	11 P	.64	
9	28.5	.183	85.5	S.	69	2.0	20	5 P	7:30 P	12 P	*	
10	29.5	.204	82.5	W.N.W.	44	2.5	22	11 P	0 A	4 A	.41	
11	8.5	.133	51.0	W.N.W.	191	4.5	30	2 P				
12	16.5	.150	61.0	N.W.	85	2.0	20	1 A				
13	13.0	.122	69.0	W.N.W.	62	0.5	10	10 P				
14	12.5	.131	63.0	N.N.W.	72	0.0	—	—				
15	16.0	.131	72.0	N.	45	0.0	—	—				
16	21.5	.154	78.0	N.	25	0.5	10	8 A				
17	22.5	.171	73.0	S.	74	3.5	26	4 P				
18	34.0	.262	76.5	S.	176	0.5	10	6 P				
19	39.0	.268	89.5	E.S.E.	240	16.5	57	3 P	0:30 A	12 P	.32	
20	29.5	.180	92.5	N.N.E.	116	0.5	10	0 A	0 A	8 P	.08	
21	28.0	.170	92.5	N.N.E.	177	3.0	24	10 P	8:30 A	11:30 P	.89	5.
22	28.0	.176	88.0	N.	159	2.5	22	3 A				
23	25.5	.190	78.0	S.S.E.	38	2.0	20	10 A				
24	33.0	.197	97.5	S.	123	1.0	14	9 A	6 P	12 P	.10	
25	37.5	.254	92.0	N.	124	2.5	22	10 A	0 A	7 P	.88	
26	40.5	.323	77.5	S.S.W.	66	1.0	14	8 P	10 P	12 P	.02	
27	39.5	.304	81.0	N.W.	126	4.5	30	4 P	0 A	8 A	.31	
28	40.5	.350	72.0	N.W.	66	0.5	10	1 P				
29	38.5	.354	68.0	S.S.W	18	0.0	—	—				
30	41.5	.323	83.5	W.S.W.	52	3.5	26	6 P	6 P	8 P	.01	
31	38.5	.363	63.0	W.N.W.	149	6.0	35	3 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather for March proved to be more pleasant than usual for the time of year. Much sunshine and a small wind movement were the most noticeable features producing the result. During the last half of the month the transition from winter to spring was especially rapid and when the month closed the season was fully as far advanced as usual: all the snow in the valley was gone and the frost was entirely out the ground in many places.

The mean barometer for the month was unusually high and the range less than any previous March record at this station. The total wind movement was but little more than half the normal and much less than for any previous year. Gales were recorded on but three dates during the month.

The mean temperature was about a degree below the normal. The maximum was the highest ever recorded here for the month although the record for 1903 nearly equaled it. The minimum was about five degrees lower than usual giving a range for the month greater than any monthly range ever before noted at this station. The departure from the normal of the dew point and relative humidity were both small.

The total precipitation was about ten per cent less than usual and fairly well distributed throughout the month. The hours of sunshine were about a third more than usual.

J. E. OSTRANDER, Meteorologist.

C. H. CHADWICK. Acting Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 196. APRIL, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.06, 24th, 0 A.
Minimum reduced to freezing, 28.91, 6th, 10 A.
Reduced† maximum reading, 30.37, 24th, 0 A.
Reduced† minimum reading, 29.22, 6th, 10 A.
Mean semi-daily reduced, ... 29.847
Monthly range, ... 1.15

****Air Temperature.*** In Degrees Fahr.

Highest, ... 79.0, 27th, 2:30 P.
Lowest, ... 22.0, 3d, 6 A.
Mean hourly, ... 45.6
Mean of means of max. and min., ... 46.1
Mean sensible (wet bulb), ... 40.0
Monthly range, ... 57.0
Highest mean daily, ... 60.3, 27th
Lowest mean daily, ... 35.4, 2d
Mean maximum, ... 57.8
Mean minimum, ... 34.4
Mean daily range, ... 23.4
Greatest daily range, ... 37.0, 24th
Least daily range, ... 8.0, 5th

Humidity.

Mean dew point, ... 33.5
Mean force of vapor, ...307
Mean relative humidity, ... 66.7

Precipitation. In inches.

Total precipitation, ... 2.56
Number of days on which .01 inch or more rain or melted snow fell, ... 9
Total snow in inches, ... Trace

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 4855 m.
Greatest daily movement, ... 355 m., 17th
Least daily movement, ... 24 m., 4th
Mean daily movement, ... 162m.
Mean hourly velocity, ... 6.7m.
Maximum pressure per square foot, 18 lbs.= 60 m. per hour, 17th, 12 M., W.
Prevailing Direction, West.

Summary.

West, ... 17 per cent.
West, Northwest, ... 17 " "
North, Northwest, ... 10 " "
South, Southwest, ... 13 " "
Other directions, ... 43 " "

Weather.

Mean cloudiness observed, ... 43 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 155 hrs.=39 per cent.
Number of clear days, ... 16
Number of fair days, ... 9
Number of cloudy days, ... 5

Bright Sunshine.

Number of hours recorded, . . . 247 hrs.=61%

Rain, 4th, 5th, 6th, 10th, 11th, 14th, 20th, 21st, 24th, 26th, 29th.

Snow, 17th.

Gales, 35 miles or more per hour, 41 m. 1st, N.N.; 44 m. 2d, N.N.W.; 38 m. 6th, W.N.W.; 60 m. 17th, W.; 39 m. 18th, W.; 48 m. 21st, S.S.W.; 35 m. 24th, W.S.W.

Thunder and Lightning, 21st.

Frost, 7th, 16th, 17th, 24th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.24	30.13	30.213	51.0	4 P	31.0	12 P	41.0	41.6	34.5	11
2	30.24	30.14	30.227	45.5	4:30 P	27.0	6:30 A	36.3	35.4	28.5	10
3	30.22	29.96	30.083	57.5	3:30 P	22.0	6 A	39.7	40.6	34.3	7
4	29.97	29.87	29.918	59.0	2:30 P	34.5	6:30 A	46.7	44.3	36.7	4
5	29.87	29.58	29.752	46.0	3 P	38.0	7 A	42.0	40.9	40.3	0
6	29.64	29.22	29.432	51.0	2 P	32.0	12 P	41.5	40.4	36.0	5
7	29.73	29.62	29 695	48.5	4 P	28.0	6:30 A	38.3	39.2	33.0	12
8	29.84	29.72	29.774	45.0	1:30 P	31.0	5:30 A	38.0	37.4	33.0	10
9	29.89	29.81	29.855	59.5	5 P	27.0	6:30 A	43.3	44.5	38.5	12
10	29.82	29.57	29.662	72.0	4:30 P	42.0	6:30 A	57.0	56.2	48.7	9
11	29.69	29.60	29.654	53.5	0 A	39.0	12 P	46.3	45.2	44.3	0
12	29.82	29.64	29.747	62.5	5 P	38.0	7 A	50.3	48.6	41.5	10
13	29.82	29.69	29.761	58.5	4 P	35.5	6:30 A	47.0	47.3	41.5	5
14	29.73	29.55	29.639	65.5	3:30 P	30.0	6 A	47.7	47.5	41.0	10
15	29.77	29.68	29.728	52.0	3 P	33.5	6 A	42.7	41.6	37.0	10
16	29.69	29.47	29.550	45.0	3:30 P	27.5	6 A	36.3	37.6	32.0	8
17	29.84	29.49	29.700	42.5	5 P	30.5	2 A	36.5	36.1	30.7	7
18	30.11	29.84	29.993	48.5	3:30 P	32.0	12 P	40.3	39.1	30.5	11
19	30.19	29.98	30.153	51.0	5 P	28 5	6:30 A	39.7	42.6	35.0	12
20	30.04	29.79	29.903	68.0	1 P	36.0	1 A	52.0	51.5	47.0	5
21	29.83	29.52	29.680	62.0	3 P	47.5	6 A	54.7	44.3	53.0	3
22	30.26	29.78	30.114	58.0	4 P	35.5	6 A	46.7	45.6	39.0	13
23	30.37	30.26	30.316	56.0	5 P	34.5	12 P	45.3	45.4	39.3	11
24	30.37	29.91	30.119	63.0	4 P	26.0	6 A	44.5	48.1	42.0	11
25	30.02	29.88	29.954	64.5	4 P	39.0	7 A	51.7	50.7	41.0	13
26	29.88	29.57	29.672	69.5	1 P	43.5	6 A	56.5	58.5	50.5	6
27	29 77	29.48	29.605	79.0	2:30 P	47.0	12 P	63.0	60.3	50.5	12
28	29.93	29.77	29.906	71.0	2 P	37.0	5 A	54.0	54.8	48.3	12
29	29.91	29.72	29.805	62.0	1:30 P	35.5	6 A	48.7	48.9	45.3	6
30	29.82	29.72	29.796	66.5	5 P	43.0	7:30 A	54.7	54.8	46.7	8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	28.5	.236	66.5	N.W.	241	8.5	41	3 P				
2	19.0	.201	53.0	N.N.W.	299	9.5	44	1 P				
3	24.5	.249	54 5	W.N.W.	36	2.0	20	12 M				
4	28.5	.275	61.5	S.S.E.	24	2.5	22	2 P	3 A	12 P	.03	
5	39.5	.255	96.0	S.S.E.	153	2.0	20	8 A	0 A	12 P	.86	
6	33.0	.232	81.0	W.N.W.	125	7.0	38	5 P	0 A	9 A	.29	
7	25.5	.223	61.0	W.	154	4.5	30	1 P				
8	28.5	.212	73.5	N.N.W.	260	3.0	24	3 P				
9	28.0	.310	51.0	W.N.W.	123	2.5	22	11 A				
10	43.0	.426	67.5	S.S.W.	284	3.5	26	11 A	5:30 A	12 P	T	
11	43.5	.375	94.5	E.N.E.	73	1.0	14	10 A	0 A	11 P	.87	
12	36.0	.311	69.0	N.N.E.	81	2.0	20	12 M				
13	34.5	.324	63.0	E.S.E.	99	0.5	10	1 P				
14	34.5	.310	66.5	N.N.E.	52	2.5	22	8 P	10:30 P	12 P	.12	
15	28.0	.260	60.5	N.W.	202	3.0	24	4 A				
16	23.0	.222	56.5	W.	132	5.0	32	12 M				
17	24.0	.201	65.5	W.	355	18.0	60	12 M	8 A	4 P		T
18	19.5	.213	49.5	W.	304	7.5	39	10 A				
19	23.5	.263	49.5	S.S.W.	209	4.5	30	1 P				
20	43.5	.358	79.5	S.W.	254	5.0	32	5 P	3 P	9 P	.04	
21	52.0	.424	92.5	S.S.W.	158	11.5	48	3 P	3:30 P	8 P	.18	
22	33.0	.281	68.0	N.N.W.	240	5.0	32	8 A				
23	32.0	.297	61.5	W.N.W.	150	3.5	26	3 P				
24	34.0	.349	59 5	W.	138	6.0	35	3 P	8:30 P	10 P	.01	
25	29.5	.352	47.5	W.N.W.	161	2.5	22	3 P				
26	44.5	.468	63.0	S.S.W.	131	1.0	14	2 P	2:30 P	9 P	T	
27	45.5	.454	67.5	E.S.E.	86	1.0	14	3 P				
28	43.0	.408	69.5	S.	112	2.5	22	3 P				
29	43.0	.331	82.5	S.W.	91	1.0	14	8 P	3 P	10 P	.16	
30	41.0	.385	69.0	S.	128	4.5	30	4 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during the month was seasonable in most respects and the departures of the several weather elements from the April normals were generally unimportant. The advance of Spring during the month was rather slow and when the month closed the season was nearly a week backward.

A low barometer predominated throughout the month; on all but seven days the mean being below 30 inches. The mean pressure was about .15 inches below the normal giving an unusually low record, and the maximum and minimum records were both low. The total wind movement was slightly less than usual notwithstanding a considerable number of gales.

The mean temperature was practically normal as were also the maximum and minimum records. Thin ice was formed on the 7th and the last frost of the month was noted on the 24th. The mean dew point and relative humidity were both practically normal. The total precipitation was about five-sixths of the usual amount and all but one-half inch of it occurred before the 12th. The amount of sunshine was unusually large and but five days were noted as cloudy during the month.

J. E. OSTRANDER. Meteorologist.

G. W. PATCH, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 197. MAY, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.08, 4th, 12 P, 5th, 8 A.
Minimum reduced to freezing, 29.24, 18th, 4 P.
Reduced† maximum reading, 30.38, 4th, 12 P, 5th, 8 A.
Reduced† minimum reading, 29.53, 18th, 4 P.
Mean semi-daily reduced, ... 29.962
Monthly range, ... 0.85

****Air Temperature.*** In Degrees Fahr.

Highest, ... 82.5, 3d, 4 P.
Lowest, ... 32.0, 24th, 6 A.
Mean hourly, ... 56.9
Mean of means of max. and min., ... 57.0
Mean sensible (wet bulb), ... 51.1
Monthly range, ... 50.5
Highest mean daily, ... 68.8, 28th
Lowest mean daily, ... 44.4, 1st
Mean maximum, ... 69.1
Mean minimum, ... 44.9
Mean daily range, ... 24.2
Greatest daily range, ... 43.0, 3d
Least daily range, ... 8.0, 14th

Humidity.

Mean dew point, ... 45.7
Mean force of vapor, ...473
Mean relative humidity, ... 68.2

Precipitation. In inches.

Total precipitation, ... 1.28
Number of days on which .01 inch or more rain or melted snow fell, ... 11
Total snow in inches, ... Trace

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement, ... 5004 m.
Greatest daily movement, ... 390 m., 26th
Least daily movement, ... 47 m., 17th
Mean daily movement, ... 161m.
Mean hourly velocity, ... 6.7m.
Maximum pressure per square foot, 9.5 lbs.= 44 m. per hour, 1st, 2 P., W.
Prevailing Direction, West Southwest.

Summary.

South, ... 13 per cent.
South, Southwest, ... 13 " "
West, Northwest, ... 13 " "
West, ... 10 " "
South, Southeast, ... 10 " "
Other directions, ... 41 " "

Weather.

Mean cloudiness observed, ... 56 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 167 hrs.=37 per cent.
Number of clear days, ... 16
Number of fair days, ... 8
Number of cloudy days, ... 7

Bright Sunshine.

Number of hours recorded, . . . 286 hrs.=63%

Rain, 2d, 5th, 6th, 9th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 26th, 29th, 30th.

Snow, 1st.

Gales, 35 miles or more per hour, 44 m. 1st, W.; 36 m. 7th, W.N.W.; 36 m. 9th, N.W.; 41 m. 25th, S.S.W.; 39 m. 26th, S.S.W.

Thunder and Lightning, 3d, 9th, 15th, 29th, 30th.

Frost, 21st, 22d, 24th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.05	29.82	29.947	50.5	4 P	37.0	12 P	43.7	44.4	38.3	7
2	30.17	30.02	30.118	61.0	3 P	33.5	5:30 A	47.3	47.5	40.0	10
3	30.02	29.74	29.864	82.5	4 P	39.5	6:30 A	61.0	60.5	53.3	13
4	30.38	29.87	30.149	62.0	9 A	48.0	12 P	55.0	54.0	51.7	0
5	30.38	30.21	30.316	64.0	3 P	46.0	6 A	55.0	53.6	48.7	9
6	30.21	29.88	30.071	76.0	3 P	48.0	2 A	62.0	61.6	57.0	9
7	29.98	29.75	29.845	78.0	12 M	51.0	12 P	64.5	65.6	57.5	12
8	30.03	29.86	29.953	72.5	3 P	39.0	5 A	55.7	56.7	50.5	14
9	29.97	29.75	29.851	62.5	3 P	39.5	4 A	51.0	50.5	45.5	13
10	30.12	29.97	30.059	69.0	6 P	45.0	12 P	57.0	54.6	46.7	13
11	30.15	29.93	30.043	77.0	3 P	41.0	6 A	59.0	55.2	49.0	14
12	30.02	29.89	29.914	71.5	6 P	48.0	4 A	59.7	57.8	51.5	3
13	30.13	30.02	30.103	64.5	6 P	51.5	7 A	58.0	55.9	53.0	1
14	30.11	29.83	29.932	58.5	6 P	50.5	6 A	54.5	54.4	54.3	0
15	29.85	29.74	29.791	75.5	3 P	55.5	0 A	65.5	64.0	60.0	3
16	29.95	29.84	29.911	59.0	12 M	42.0	12 P	50.5	51.4	48.0	0
17	29.94	29.79	29.859	52.5	3 P	41.5	6 A	47.0	46.6	44.3	0
18	29.79	29.53	29.615	69.5	3 P	45.0	6 A	57.3	55.7	49.5	6
19	29.66	29.57	29.603	69.5	4 P	47.0	12 P	58.3	58.4	50.0	12
20	29.98	29.66	29.825	57.0	4 P	38.0	6 A	47.5	47.3	42.3	11
21	30.04	29.98	29.998	60.5	5 P	33.5	5 A	47.0	49.8	48.5	8
22	30.05	29.87	29.945	71.5	4 P	33.0	5:30 A	52.3	55.1	48.3	14
23	30.09	29.88	29.990	69.0	3 P	42.5	6 A	55.7	56.6	48.3	13
24	30.15	30.04	30.087	72.0	3 P	32.0	6 A	52.0	55.0	49.0	14
25	30.17	29.07	30.116	74.0	2 P	46.0	5:30 A	60.0	59.5	51.5	12
26	30.09	29.97	30.051	77.0	2 P	55.0	6 A	66.0	65.1	59.7	15
27	30.09	29.98	30.040	75.5	12 M	59.5	6 A	67.5	66.5	63.7	8
28	30.00	29.91	29.958	80.5	5 P	58.5	5 A	69.5	68.8	59.5	14
29	30.02	29.77	29.919	82.0	5 P	46.0	5 A	64.0	68.0	59.0	14
30	30.01	29.74	29.903	73.5	4 P	53.5	7 A	63.5	61.7	53.3	12
31	30.06	30.01	30.040	74.0	5 P	45.0	6 A	59.5	62.0	51.3	14

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	31.0	.278	64.0	W.N.W.	312	9.5	44	2 P	9 A	1 P		T
2	29.0	.327	50.0	W.S.W.	188	5.0	32	12 M	6 A	8 P	T	
3	48.0	.543	65 5	S.	162	3.5	26	3 P				
4	47.0	.462	72.0	N.N.E.	213	3.5	26	9 A				
5	45.5	.391	78.5	S.	193	4.0	28	1 P	10 P	12 P	.01	
6	55.0	.517	84.5	S.S.W.	208	4.0	28	1 P	6 P	12 P	.01	
7	51.0	.625	62.5	N.W.	297	6.5	36	9 A				
8	44.5	.468	62.5	S.S.W.	179	5.0	32	2 P				
9	41.0	.357	72.0	N.W.	296	6.5	36	12 M	0:30 A	8 A	.12	
10	39.5	.420	56.0	N.	166	4.0	28	2 P				
11	41.0	.471	53.5	S.W.	108	1.5	17	5 P				
12	45.5	.492	65.5	S.	95	2.0	20	2 P	3 A	12 P	.21	
13	51.0	.450	84.0	S.S.E.	65	1.5	17	8 P	0 A	8 A	.03	
14	53.5	.440	94.0	S.	117	1.0	14	3 A	11 A	3 P	.24	
15	60.0	.563	91.0	S.S.E.	63	2.5	22	4 P	3:30 P	8 P	.33	
16	46.5	.363	87.0	E.N.E.	100	1.5	17	0 A	9 A	12 P	.22	
17	42.5	.316	85.5	N.E.	47	0.5	10	2 A	5:30 P	6:30 P	T	
18	47.0	.400	81.5	N.E.	57	1.5	17	4 P	5 P	8 P	.03	
19	41.0	.466	58.0	W.N.W.	288	5.5	33	2 P				
20	34.0	.340	59.5	N.N.W.	216	5.5	33	5 P				
21	44.5	.403	72.0	W.N.W.	101	3.0	24	11 A				
22	40.0	.462	53.5	W.N.W.	81	2.0	20	11 A				
23	37.5	.477	48.5	N.N.W.	110	5.0	32	5 P				
24	41.5	.456	58.0	W.S.W.	80	1.5	17	10 P				
25	45.0	.495	60.5	S.S.W.	306	8.5	41	5 P				
26	56.0	.625	71.5	S.S.W.	390	7.5	39	10 A	8 P	8:30 P	T	
27	62.0	.663	85.0	S.S.E.	121	3.0	24	2 P				
28	54.0	.676	62.5	W.	90	1.5	17	11 A				
29	52.5	.703	55.5	W.	90	3.5	26	6 P	11 P	12 P	.01	
30	48.0	.511	66.5	N.	180	3.5	26	2 A	0 A	1 A	.07	
31	43.0	.514	52.5	W.	85	2.0	20	7 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during the month was pleasant although there was a number of unusually cool days. The most noticeable features were the small precipitation and large wind movement. The hours of sunshine were also considerably more than usual.

The barometric record presented no unusual features. The mean pressure for the month, the range and the extreme records were all practically normal.

The mean temperature was but slightly less than the normal while the maximum was 4 degrees below the normal and the minimum 2 degrees higher than usual, giving a comparatively small range. While the temperature at the station did not fall below the freezing point, traces of ice were reported the morning of the 2nd, and light frosts on the 21st, 22nd and 24th. On the last date some little damage was reported from the low places in this vicinity.

The total precipitation was only one-third the normal amount and one-half the amount recorded during April. The small precipitation of the last two months has left the ground very dry and vegetation is beginning to suffer.

The total wind movement was considerably more than the normal and the direction more changeable than usual. Several moderate gales were noted while the maximum pressure was much less than the average. The mean relative humidity was slightly higher than the normal.

J. E. OSTRANDER, Meteorologist.

G. W. PATCH, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 198. JUNE, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.90, 9th, 8 A. 5th, 8 A.
Minimum reduced to freezing, 29.08, 26th, 1 P.
Reduced† maximum reading, 30.19, 9th, 8 A.
Reduced† minimum reading, 29.36, 26th, 1 P.
Mean semi-daily reduced, ... 29.933
Monthly range, ... 0.83

****Air Temperature.*** In Degrees Fahr.

Highest, ... 90.0, 15th, 3 P.
Lowest, ... 36.0, 9th, 5:30 A.
Mean hourly, ... 64.4
Mean of means of max. and min., ... 64.3
Mean sensible (wet bulb), ... 59.3
Monthly range, ... 54.0
Highest mean daily, ... 77.6, 18th
Lowest mean daily, ... 50.5, 8th
Mean maximum, ... 76.4
Mean minimum, ... 52.1
Mean daily range, ... 24.3
Greatest daily range, ... 45.0, 9th
Least daily range, ... 3.0, 12th

Humidity.

Mean dew point, ... 56.5
Mean force of vapor, ...602
Mean relative humidity, ... 78.8

Precipitation. In inches.

Total precipitation, ... 2.86
Number of days on which .01 inch or more rain or melted snow fell, ... 12

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 3108 m.
Greatest daily movement, ... 236 m., 8th
Least daily movement, ... 1 m., 22d
Mean daily movement, ... 103m.
Mean hourly velocity, ... 4.3m.
Maximum pressure per square foot, 6.0 lbs.= 35 m. per hour, 26th, 2 P., W.N.W.
Prevailing Direction, West Northwest.

Summary.

South, Southwest, ... 17 per cent.
North, ... 10 " "
Northeast, ... 10 " "
West, Southwest . . . . . 10 " "
Southwest, ... 10 " "
Other directions, ... 43 " "

Weather.

Mean cloudiness observed, ... 61 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 210 hrs.=46 per cent.
Number of clear days, ... 8
Number of fair days, ... 14
Number of cloudy days, ... 8

Bright Sunshine.

Number of hours recorded, . . . 247 hrs.=54%

Rain, 2d, 4th, 6th, 7th, 8th, 11th, 12th, 13th, 18th, 19th, 20th, 21st, 22d, 23d, 26th, 27th.

Gales, 35 miles or more per hour, 35 m. 26th, W.N.W.

Thunder and Lightning, 2d, 5th, 13th, 17th, 18th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.06	29.95	30.008	74.0	3:30 P	43.0	5:30 A	58.5	59.2	51.5	10
2	29.98	29.79	29.813	75.5	1 P	41.5	5 A	58.5	58.5	55.0	8
3	30.08	29.86	30.013	72.5	5 P	47.0	12 P	59.7	59.2	51.5	12
4	30.09	29.84	29.894	76.5	1:30 P	38.0	6 A	57.3	59.7	57.7	10
5	29.88	29.67	29.808	80.5	4 P	55.0	5 A	67.7	69.7	65.3	10
6	30.03	29.56	29.819	66.0	6 A	51.0	12 P	58.5	59.0	55.3	0
7	30.09	29.91	30 009	57.0	3 P	43.0	12 P	50.0	59.8	46.0	2
8	30.07	29.89	29.972	65.0	6 P	42.0	3 A	53.5	50.5	46.5	9
9	30.19	30.00	30.104	81.0	2 P	36.0	5:30 A	58.5	59.3	54.5	13
10	30.04	29.94	30.006	83.0	2 P	45.0	5:30 A	64.0	67.8	62.0	11
11	29.99	29.80	29.865	75.0	3 P	58.5	5:30 A	66.7	65.6	60.3	4
12	29.80	29.73	29.765	64.0	7 P	61.0	4 A	62.5	62.3	62.0	0
13	29.90	29.71	29.808	82.5	2:30 P	58.0	12 P	70.3	67.4	63.5	8
14	30.08	29.90	29.998	84.5	3 P	56.0	3 A	70.3	68.5	64.0	12
15	30.13	30.05	30.090	90.0	3 P	53 0	5 A	71.5	72.2	68.3	13
16	30.11	30.03	30.077	87.5	1:30 P	67.0	3 A	77.3	74.0	67.3	10
17	30.06	29.96	30.002	85.0	2 P	63.0	5 A	74.0	73.6	69.5	10
18	30.02	29.92	29.930	87.5	5 P	68.0	5:30 A	77.7	77.6	73.7	10
19	30.13	29.95	30.061	73.0	0 A	52 0	12 P	62.5	61.4	56.0	1
20	30.13	30.04	30.085	61.0	3 P	50.0	7 A	55.5	54.6	53.7	1
21	30.06	29.83	29.898	62.0	6 P	57.0	2 A	59 5	59.9	58.5	0
22	29.83	29.79	29.804	74.5	2 P	59.0	6 A	66.7	65.7	65.2	4
23	30.05	29.82	29.995	80.5	12 M	64.0	5 A	72.3	70.0	64.0	9
24	30.11	29.94	30.038	78.5	5:30 P	56.0	5:30 A	67.3	65.7	58.3	11
25	29.94	29.64	29.787	82.0	5 P	48.0	5 A	65.0	68.0	62.3	13
26	29.73	29.36	29.575	84.5	2 P	54.5	12 P	69.5	67.2	58.3	9
27	29 88	29.73	29.850	68.5	5:30 P	50.0	5:30 A	59.3	57.9	51.5	9
28	29.95	29.83	29.902	74 5	3 P	49.0	5:30 A	61.7	61.5	55.7	13
29	30.02	29.95	29.972	83.0	5 P	48.5	5:30 A	65.7	66.9	59.5	12
30	30.09	30.02	30.053	84.5	5 P	49.5	5:30 A	67.0	68.6	61.7	13

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	47.0	.468	67.5	S.S.E.	103	1.0	14	1 P				
2	51.5	.505	76.5	S.S.W.	136	5.5	33	6 A	1:30 P	9 P	.04	
3	47.0	.470	68 0	N.N.W.	184	4.0	28	11 A				
4	55.5	.547	80.5	W.S.W.	108	3.5	26	3 P	8 P	9 A	T	
5	62.0	.753	74.0	W.S.W.	110	3.0	24	7 P				
6	53.5	.487	83.5	S.S.W.	184	4.5	30	7 A	0 A	4 P	.36	
7	43.0	.348	80.0	E.N.E.	90	1.5	17	4 P	6 P	12 P	.31	
8	43.0	.368	77.0	N.N.E.	236	5.5	33	5 P	0 A	9 A	T	
9	51.5	.504	74.5	N.W.	40	0.5	10	6 P				
10	58.5	.694	70.5	S.W.	93	1.5	17	12 M				
11	56.5	.652	70.0	S.	180	4.0	28	8 P	9:30 A	4 P	.01	
12	61.5	.583	93.0	S.	121	1.5	17	0 A	8 A	8 P	.22	
13	63.0	.597	97.0	S.S.W.	70	3.0	24	6 P	6:30 P	10 P	.32	
14	62.0	.680	82.0	W.	70	1.5	17	12 M				
15	67.5	.784	84.5	S.W.	30	1.0	14	8 P				
16	65.0	.759	83.5	S.S.W.	114	2.0	20	7 P				
17	67.5	.819	81.0	S.S.W.	153	3.5	26	2 P				
18	71.5	.983	78.0	W.S.W.	199	2.5	22	2 P	12:30M	12 P	T	
19	54.5	.484	89.0	N.E.	97	1.0	14	2 P	0 A	7 P	.13	
20	53.0	.426	95.5	N.E.	18	0.0	—	—	3 A	12 P	.18	
21	57.5	.513	93.0	N.E.	5	0.0	—	—	0 A	12 P	.78	
22	65.0	.639	96.0	W.N.W.	1	2.5	22	10 P	2:30 P	5 P	.40	
23	60.0	.764	68.0	N.N.E.	155	1.0	14	3 A	0 A	3 A	.01	
24	55.0	.573	76.5	N.	13	0.0	—	—				
25	58.5	.710	70.0	N.	85	4.0	28	3 P				
26	55.0	.563	79.5	N.W.	201	6.0	35	2 P	1 A	8 A	.10	
27	48.5	.440	77.5	N.	115	4.0	28	11 A	1 P	3 P	T	
28	50.0	.573	64.0	N.N.W.	90	3.0	24	12 M				
29	54.0	.668	63.5	W.N.W.	67	1.0	14	10 A				
30	57.5	.692	70.0	S.W.	30	0.5	10	9 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during June was slightly cooler than usual and the precipitation considerably less than the normal amount. The small rainfall of the preceding two months combined with that of June shows a deficiency for the period from April 1st of more than four inches. The total for the three months is the smallest for the period since 1896 and exceeds the record for 1896 by only about one-fourth of an inch. The records for the other weather elements show only unimportant departures from the normals.

The mean barometer was slightly lower than usual and the range about ten per cent more than the normal. The record was the more unsteady during the first half of the month. The total wind movement was about eighty per cent of the normal and no heavy gales were noted. The changes in the direction of wind were more frequent than usual.

The mean temperature was about one and one-half degrees below the normal and the maximum and minimum were both low. The minimum was the lowest June record since 1891.

The mean dew point was below the normal and the relative humidity unusually high.

The total precipitation was about seventy per cent of the normal and was fairly well distributed throughout the month, although more than half the total fell during the four days 19th—22d.

The only heavy thunder storm occurred on the 13th. The amount of sunshine recorded was slightly more than the normal amount.

J. E. OSTRANDER. Meteorologist.

C. H. CHADWICK, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 199. JULY, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.86, 16th, 8 A.
Minimum reduced to freezing,	29.28, 31st, 4 A.
Reduced† maximum reading,	30.15, 16th, 8 A.
Reduced† minimum reading,	29.57, 31st, 4 A.
Mean semi-daily reduced,	29.948
Monthly range,	0.58

****Air Temperature.*** In Degrees Fahr.

Highest,	93.0, 10th, 2:30 P.
Lowest,	46.0, 27th, 5:30 A.
Mean hourly,	71.1
Mean of means of max. and min.,	71.8
Mean sensible (wet bulb),	65.6
Monthly range,	47.0
Highest mean daily,	81.3, 18th
Lowest mean daily,	59.0, 24th
Mean maximum,	82.9
Mean minimum,	60.6
Mean daily range,	22.3
Greatest daily range,	34.5, 22d, 27th, 28th
Least daily range,	4.5, 2d

Humidity.

Mean dew point,	63.2
Mean force of vapor,	.748
Mean relative humidity,	79.1

Precipitation. In inches.

Total precipitation,	2.63
Number of days on which .01 inch or more rain or melted snow fell,	15

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement,	3464 m.
Greatest daily movement,	245 m., 2d
Least daily movement,	19 m., 24th
Mean daily movement,	111m.
Mean hourly velocity,	4.6m.
Maximum pressure per square foot,	9.0 lbs.= 43 m. per hour, 10th, 4 P., W.S.W.
Prevailing Direction,	West Southwest.

Summary.

South, Southwest,	26 per cent.
West,	19 " "
Southwest,	13 " "
Northeast,	10 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	55 per cent.
Total cloudiness recorded by the Sun Thermometer,	199.5 hrs.=43 per cent.
Number of clear days,	6
Number of fair days,	19
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 262½ hrs.=57%

Rain, 2d, 3d, 8th, 9th, 10th, 11th, 13th, 14th, 17th, 19th, 23d, 24th, 26th, 29th. 30th, 31st.

Gales, 35 miles or more per hour, 43 m. 10th, W.S.W.; 39 m. 26th N.W.

Thunder and Lightning, 8th, 9th, 10th, 11th, 13th, 14th, 17th, 19th, 26th, 30th.

Hail, 26th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.09	30.02	30.067	79.0	3 P	60.0	5 A	69.5	68.3	62.5	9
2	30.02	29.85	29.900	68.5	2 P	64.0	6 A	66.3	65.9	64.7	0
3	29.99	29.85	29.909	87.5	3 P	63.5	5 A	75.5	73.0	67.0	12
4	30.05	29.99	30.003	89.5	2 P	58.5	4 A	74.0	73.2	64.3	10
5	30.11	30.05	30.084	85.0	3 P	60.0	5:30 A	72.5	72.1	65.5	13
6	30.11	30.04	30.070	84.0	4:30 P	62.0	4 A	73.0	71.8	66.0	9½
7	30.06	29.94	30 007	85.0	4 P	65.0	3 A	75.0	73.0	67.0	8½
8	29.98	29.88	29.936	89.5	3 P	66.0	3 A	77.7	74.3	69.0	8
9	29.97	29.87	29.920	92.5	2:30 P	70.0	6 A	81.3	78.2	72.0	8
10	30.04	29.95	30.022	93.0	2:30 P	63.5	5:30 A	78.3	79.9	69.7	8
11	30.08	30.02	30.053	89.0	2:30 P	65.0	5 A	77.0	75.7	72.7	8
12	30.10	30.02	30.075	91.0	4 P	71.0	6 A	81.0	78.8	73.0	9
13	30.08	30.02	30.052	90.0	1 P	71.0	4 A	80.5	77.6	72.0	10
14	30.05	29.95	30.000	89.0	2:30 P	67.0	12 P	78.0	76.4	71.0	10
15	30.10	29.97	30.016	80.0	4 P	60.0	12 P	70.0	71.5	64.0	13
16	30.15	29.95	30.062	82.0	5 P	50.0	5:30 A	66.0	68.4	63.5	11
17	29.98	29 79	29.844	89.0	5 P	66.5	6 A	77.7	75.2	69.7	9
18	29.88	29.79	29.827	92.5	5 P	67.5	5:30 A	80.0	81.3	76.0	12
19	29.83	29.80	29.805	91.0	2 P	70 0	6 A	80.5	76.8	70.5	5
20	29.86	29.72	29.771	83.0	3 P	64.0	6 A	73.5	73.4	65.7	10
21	29.96	29.86	29.894	79.5	3 P	54.0	6 A	66.7	67.6	58.3	13
22	30.01	29.96	29.992	81.5	3 P	47.0	6 A	64.3	66.1	60.0	12
23	30.00	29.93	29.972	74.0	3 P	56.0	6 A	65.0	64.1	58.7	5
24	29.99	29.89	29 940	63.5	3 P	53.0	3 A	58.3	59.0	58.5	0
25	29.96	29.85	29.889	77.0	10:30 A	56.0	12 P	66.5	66.0	60.5	10
26	30.00	29.93	29.968	77.5	4 P	49.0	5:30 A	63.3	63.0	58.3	10
27	30 07	29.98	30.039	80.5	5 P	46.0	5:30 A	63.3	65.7	60.5	11
28	30.10	29.99	30.053	84 0	1 P	49.5	5:30 A	66.7	69.4	62.3	10½
29	30.04	29 83	29.930	82.0	2 P	60.0	6 A	71.0	68.5	66.7	7
30	29.83	29.58	29.651	74 0	4 P	63.0	12 P	68.5	67.1	65.0	1
31	29 74	29.57	29.644	68 5	3:30 P	60.0	5 A	64.3	64 1	60.3	0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	59 5	.679	74.5	S.S.W.	213	4.5	30	1 P				
2	64.0	.647	92.5	S.S.W.	245	3.0	24	7 A	3 A	12 P	.03	
3	64.0	.803	75 0	N.N.E.	113	2.0	20	1 P	0 A	4 A	.02	
4	60.5	.743	74.0	S.W.	67	4.0	28	4 P				
5	62.5	.760	75.0	S.S.W.	162	2.5	22	6 P				
6	63 5	.764	77.0	S S W.	129	2.0	20	4 P				
7	64.5	.781	77.0	S.W.	160	2.5	22	3 P				
8	67.5	.786	85.0	S.S.W.	157	3.5	26	3 P	3:30 P	6:30 P	T	
9	70.5	.882	84.5	S.S.W.	125	4.0	28	5 P	3 A	5 A	.01	
10	69.5	.779	90.5	S.W.	64	9.0	43	4 P	3:30 P	4:30 P	.40	
11	72.0	.888	87.5	S.	29	0.5	10	3 P	4 P	6 P	.02	
12	71.0	.912	85.0	S.S.W.	122	2.5	22	2 P				
13	69 5	.965	74.0	S.W.	232	3.0	24	9 A	1 P	3 P	.03	
14	68.5	.870	81.0	W.S.W.	146	3.5	26	3 P	3:30 P	10:30 P	.26	
15	60.5	.757	69.0	N.N.W.	130	4.0	28	2 P				
16	60 0	.715	73.5	W.S.W.	52	1.5	17	3 P				
17	68.5	.817	88.0	W.	127	1.0	14	1 P	3 A	9 A	.40	
18	73.5	1.105	74.0	W.	84	2.5	22	2 P				
19	69.0	.839	84.5	W.	76	2.0	20	4 P	3 P	4:30 P	.01	
20	62.0	.815	68.0	W.N.W.	126	2.5	22	4 P				
21	52.0	.670	58.0	N.W.	70	1.5	17	3 P				
22	55.5	.652	67.5	W.	40	0.5	10	6 P				
23	56.5	.571	80.0	E.	78	2.0	20	2 P	6:30 A	8:30 A	.04	
24	57.5	.525	90 5	N.E.	19	3.5	26	4 P	7 A	8:30 P	.30	
25	57.0	.618	78.0	W.	99	3.0	24	6 P				
26	55 5	.569	78.5	W.	109	7.5	39	6 P	1:30 P	7 P	.20	
27	57.5	.636	74.5	W.N.W.	89	2.5	22	3 P				
28	58.5	.693	73.0	S.S.W.	67	1.5	17	12 M				
29	66 0	.708	89.5	S.E.	91	4.0	28	3 P	11:30 A	12 P	.39	
30	64.5	.638	95 0	N.E.	67	1.0	14	5 P	0 A	12 P	.51	
31	57.0	.597	79.0	N.E.	176	4.0	28	6 P	0 A	12 P	.01	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during July was characterized by the high temperature which prevailed during the first two-thirds of the month, and the comparatively small precipitation. Although rain was noted on sixteen days of the month the total rainfall was only about fifty per cent of the July normal. The *deficiency* in precipitation has steadily increased since the first of February and for the half year from that date amounted to nearly nine inches; or expressing it otherwise the precipitation of the last six months has been only about five-eighths of the normal amount.

The records for the month show a nearly normal mean barometer with a range slightly less than usual. The total wind movement was slightly more than usual and the direction for two-thirds of the days between South Southwest and West.

The mean temperature was nearly two degrees higher than usual while the maximum and minimum were nearly normal. From the 3d to the 20th inclusive, unusually warm weather prevailed, the maximum reached 80 degrees or higher every day and the minimum fell below 60 degrees but twice during the period. The mean daily temperature from hourly readings was above 70 degrees on every date but one during the eighteen days.

The precipitation was well distributed throughout the month. On the 26th at about 6 P. M. a shower and hailstorm suddenly appeared. While the path of the hailstorm was narrow the damage to crops is estimated at more than $50,000. About 200 acres of tobacco was reported as ruined.

The outlook for an apple crop is reported fair for the "off year." Peaches and plums promise a half crop or better. Corn is about in average condition and tobacco is reported as promising well where not injured by hail.

J. E. OSTRANDER. Meteorologist.

C. H. CHADWICK, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No 200. AUGUST, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.98, 18th, 10 A.
Minimum reduced to freezing,	29.26, 30th, 12 P.
Reduced† maximum reading,	30.27, 18th, 10 A.
Reduced† minimum reading,	29.55, 30th, 12 P.
Mean semi-daily reduced,	29.983
Monthly range,	0.72

****Air Temperature.*** In Degrees Fahr.

Highest,	89.0, 11th, 1 P.: 22d, 3 P.
Lowest,	41.5, 28th, 6 A.
Mean hourly,	65.8
Mean of means of max. and min.,	66.2
Mean sensible (wet bulb),	61.2
Monthly range,	47.5
Highest mean daily,	75.7, 12th
Lowest mean daily,	55.0, 16th
Mean maximum,	77.9
Mean minimum,	54.6
Mean daily range,	23.3
Greatest daily range,	35.0, 24th
Least daily range,	9.0, 15th

Humidity.

Mean dew point,	59.0
Mean force of vapor,	.624
Mean relative humidity,	82.5

Precipitation. In inches.

Total precipitation,	6.47
Number of days on which .01 inch or more rain or melted snow fell,	15

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3030 m.
Greatest daily movement,	242 m., 12th
Least daily movement,	13 m., 9th
Mean daily movement,	98m.
Mean hourly velocity,	4.1m.
Maximum pressure per square foot,	7.0 lbs.= 37 m. per hour, 13th, 3 P., N.E.
Prevailing Direction,	South.

Summary.

Northeast,	19 per cent.
South,	13 " "
South, Southwest,	13 " "
Southwest,	10 " "
Other directions,	45 " "

Weather.

Mean cloudiness observed,	56 per cent.
Total cloudiness recorded by the Sun Thermometer,	187 hrs.=44 per cent.
Number of clear days,	9
Number of fair days,	13
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded,	242 hrs.=56%

Rain, 1st, 6th, 8th, 9th, 11th, 12th, 15th, 16th, 20th, 22d, 25th, 26th, 27th, 29th, 30th, 31st.

Gales, 35 miles or more per hour, 37 m. 13th. N.E.

Thunder and Lightning, 6th, 9th, 11th, 29th, 30th, 31st.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.90	29.73	29.848	74.0	3:30 P	55.0	12 P	64.5	62.7	58.3	6
2	29.97	29.88	29.928	82.0	3:30 P	48.0	5:30 A	65.3	66.0	61.7	12
3	30.02	29.97	29.990	82.0	3 P	50.0	6 A	66.0	67.1	61.0	13
4	30.06	29.97	30.017	80.0	3 P	48.0	5 A	64.0	67.9	63.5	12
5	30.04	29.97	30.029	83.5	3 P	63.0	12 P	73.3	72.5	66.3	9
6	30.02	29.81	29.890	77.0	4 P	56.0	5:30 A	66.5	66.0	63.3	5½
7	29.94	29.82	29.881	85.5	2 P	56.5	5 A	71.0	70.0	64.3	10
8	30.04	29.94	30.003	79.5	4:30 P	55.0	6 A	67.3	66.8	64.7	3
9	30.09	30.04	30.071	78.0	1 P	63.5	7 A	70.7	69.4	67.5	3
10	30.15	30.04	30.099	85.0	3 P	65.5	5 A	75.3	74.5	69.7	8½
11	30.14	30.02	30.093	89.0	1 P	70.0	12 P	79.5	75.3	71.7	3
12	30.08	29.86	29.919	84.5	2 P	69.5	3 A	77.0	75.7	73.3	7
13	30.06	29.86	29.949	84.0	4 P	61.0	12 P	72.5	74.0	66.5	11
14	30.12	30.01	30.062	78.0	5 P	52.0	5:30 A	65.0	65.6	58.5	12
15	30.04	29.75	29.851	62.0	8:30 A	53.0	12 P	57.5	57.2	55.3	0
16	30.05	29.69	29.866	61.0	6 P	51.5	7 A	56.3	55.0	53.5	0
17	30.22	30.05	30.140	76.5	4 P	43.0	6 A	59.7	60.5	53.3	11
18	30.27	30.17	30.226	77.0	3 P	45.0	6 A	61.0	61.4	55.5	10
19	30.22	30.07	30.132	74.5	3 P	45.5	6 A	60.0	59.4	53.0	12
20	30.07	29.91	29.997	73.5	3 P	43.5	6 A	58.5	59.7	56.5	8
21	30.06	29.97	30.015	84.5	4 P	54.0	4 A	69.3	68.5	62.3	9
22	29.99	29.84	29.942	89.0	3 P	64.0	6 A	76.5	72.3	67.0	8
23	30.04	29.91	30.010	85.0	5 P	59.0	6 A	72.0	70.5	64.3	12
24	30.04	29.88	29.979	88.0	5 P	53.0	6 A	70.5	70.3	65.5	10½
25	30.08	29.99	30.060	70.0	4 P	55.0	12 P	62.5	63.1	58.0	4
26	30.07	29.94	29.996	77.0	4 P	54.0	3 A	65.5	63.4	56.5	10
27	30.16	29.99	30.115	66.0	3 P	49.0	12 P	57.5	57.0	52.7	4½
28	30.19	29.96	30.099	73.0	2:30 P	41.5	6 A	57.3	58.3	53.3	10
29	29.96	29.78	29.833	77.0	6 P	56.0	6 A	66.5	64.0	58.7	11
30	29.83	29.55	29.632	68.0	12 M	58.5	5 A	63.3	62.9	61.5	0
31	29.99	29.55	29.797	70.0	5:30 P	53.0	12 P	61.5	61.3	58.5	7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	57 0	.524	89.0	N.N.E.	180	4.0	28	5 P	0 A	5:30 P	.07	
2	58.5	.672	72.5	N.N.E.	40	1.0	14	4 P				
3	56.5	.672	71 0	N.	36	1.0	14	5 P				
4	59.5	.747	68.0	W.	83	2.0	20	1 P				
5	63.5	.752	79.0	S.	189	3.5	26	4 P				
6	62.0	.604	95.0	S.S.W.	102	3.0	24	6 P	6:30 P	8 P	.18	
7	61.5	.710	80.0	S.W.	40	0.5	10	2 P				
8	64.0	.682	87.0	W.	39	0.5	10	4 P	11 A	11:30A	T	
9	67.0	.710	93.0	S.	13	2.5	22	2 P	0½ P	6 P	.07	
10	68.0	.826	83.5	S.S.W.	157	3.0	24	4 P				
11	71.5	.813	94.0	S.S.W.	200	2.5	22	7 P	7 A	9 P	1.34	
12	72.0	.911	86.0	S.W.	242	1.0	14	12 M	10 A	3 P	.02	
13	63.0	.817	71.0	N.E.	148	7.0	37	3 P				
14	54.0	.617	68.0	S.	58	0.5	10	8 P				
15	52.0	.490	80.0	S.E.	80	0.5	10	12 M	8 A	12 P	.90	
16	52.5	.438	90.0	E.N.E.	144	0.5	10	10 A	0 A	4 P	.50	
17	51.0	.459	82.0	N.E.	67	0.5	10	11 A				
18	53.0	.519	77.5	S.S.W.	41	0.5	10	8 P				
19	50.0	.451	81.5	E.S.E.	107	1.5	17	6 P				
20	54.0	.535	79.0	S.E.	50	0.0	—	—	7 P	12 P	.01	
21	60.5	.633	85.5	S.S.E.	30	0.0	—	—				
22	65.5	.740	83 5	W.S.W.	149	4 0	28	3 P	4 P	5 P	.13	
23	61.5	.708	77.5	N.W.	43	0.5	10	8 A				
24	63.5	.717	82 0	S.	54	1.5	17	5 P				
25	56.5	.519	89.0	N.E.	71	0.5	10	8 A	0 A	10 A	.89	
26	53.0	.542	75.0	N.E.	109	2.0	20	2 P	9 P	12 P	.30	
27	51.5	.431	86.5	N.E.	169	2.5	22	5 P	0 A	3 P	.22	
28	51.0	.447	84.5	W.S.W.	34	0.5	10	5 P				
29	57.0	.553	84.0	N.W.	94	2.5	22	12 M	0 A	5 A	.10	
30	60.5	.581	91.0	S.W.	161	5.5	33	3 P	12 M	12 P	1.69	
31	57.5	.517	91.5	N.E.	100	1.5	17	9 A	0 A	1 P	.05	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The most noticeable features of the weather during August were the large precipitation and comparatively low temperature. For the first time since January the total precipitation has exceeded the monthly normal. The oniy August record showing a larger rainfall since this station was established is that for 1898 when the amount was 6.85 inches.

The mean barometric record for the month was about normal and the range was ten per cent more than usual. The fluctuations were generally slow and unimportant excepting a rather rapid rise on the 31st after a heavy shower. The wind was more variable than usual; the amount from the Northeast quadrant being considerably more than usual. The total movement for the month was but slightly more than the normal.

The mean monthly temperature was nearly two degrees below the normal, and the maximnm and minimum for the month were both slightly lower than the normal records. The mean dew point was about a degree below the normal. The relative humidity record was unusually high.

The total precipitation was more than fifty per cent in excess of the normal and was well distributed throughout the month. The showers on the evenings of the 11th and 30th were unusually heavy and the lightning very severe. The observed cloudiness was slightly more than usual.

Corn has made good progress during the month and the outlook for a large yield is excellent. Tobacco is of excellent quality and the yield large. Peaches and plums are a fair crop but the apple crop is of inferior quality.

J. E. OSTRANDER. Meteorologist.

C. H. CHADWICK, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No 201. SEPTEMBER, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.11, 15th, 8 A.
Minimum reduced to freezing,	29.47, 22d, 5 P.
Reduced† maximum reading,	30.41, 15th, 8 A.
Reduced† minimum reading,	29.75, 22d, 5 P.
Mean semi-daily reduced,	30.046
Monthly range,	0.66

****Air Temperature.*** In Degrees Fahr.

Highest,	85.0, 30th, 3:30 P.
Lowest,	32.0, 27th, 6:30 A.
Mean hourly,	59.1
Mean of means of max. and min.,	59.8
Mean sensible (wet bulb),	55.0
Monthly range,	53.0
Highest mean daily,	66.5, 4th
Lowest mean daily,	45.4, 26th
Mean maximum,	70.9
Mean minimum,	48.7
Mean daily range,	22.2
Greatest daily range,	38.0, 28th
Least daily range,	4.0, 18th

Humidity.

Mean dew point,	52.4
Mean force of vapor,	.489
Mean relative humidity,	83.2

Precipitation. In inches.

Total precipitation,	6.26
Number of days on which .01 inch or more rain or melted snow fell,	11

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	2527 m.
Greatest daily movement,	196 m., 25th
Least daily movement,	4 m., 1st
Mean daily movement,	84 m.
Mean hourly velocity,	3.5 m.
Maximum pressure per square foot, 37 m. per hour, 13th, 6 P., N.	7.0 lbs.=

Prevailing Direction, West.

Summary.

North,	13 per cent.
Southwest,	13 " "
South,	10 " "
South, Southwest,	10 " "
West, Southwest,	10 " "
West,	10 " "
Other directions,	34 " "

Weather.

Mean cloudiness observed,	48 per cent.
Total cloudiness recorded by the Sun Thermometer,	187 hrs.=50 per cent.
Number of clear days,	10
Number of fair days,	8
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, 186 hrs.=50%

Rain, 1st, 2d, 3d, 4th, 6th, 11th, 12th, 15th, 16th, 17th, 18th, 19th, 20th.

Gales, 35 miles or more per hour, 37 m. 13th, N.

Thunder and Lightning, 4th, 6th, 24th.

Light Frosts, 15th, 24th, 26th, 27th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.09	29.99	30.043	69.0	5:30 P	50.0	2:30 A	59.5	57.5	55.5	3.0
2	30.16	30.09	30.140	71.0	2 P	47.0	3 A	59.0	58.4	56.7	4.7
3	30.12	30.01	30.045	66.5	2 P	62.0	1 A	64.3	64.2	64.0	0.0
4	30.01	29.84	29.932	73.0	6 P	64.0	7 A	68.5	66.5	65.5	2.6
5	29.94	29.88	29.921	78.0	4 P	56.0	12 P	67.0	65.6	59.7	9.6
6	29.96	29.88	29.934	72.0	6 P	52.0	6 A	62.0	60.1	57.5	6.3
7	30.05	29.96	30 006	72.0	2 P	47.5	6:30 A	59.7	59.2	55.7	7.0
8	30.19	30.05	30.144	76.0	4:30 P	49 0	12 P	62.5	61.4	55.0	12.6
9	30.25	30.19	30.234	80.5	5 P	45.0	6 A	62.7	60.3	54.3	11.0
10	30.25	30.12	30.189	81.0	3 P	45.5	6 A	63.3	62.9	57.5	11.0
11	30.13	29 91	30.071	67.0	3 P	53.0	7 A	60.0	59.6	57.0	0.0
12	29.92	29.87	29.892	67.0	5:30 P	55.0	2 A	61.0	61.2	62.3	0.0
13	30.13	29.87	29 968	76.0	3 P	49.0	12 P	62.5	62.5	55.3	5.5
14	30.37	30.13	30.311	65.0	4 P	41.0	12 P	53.0	51.2	42.0	11.0
15	30 41	30.30	30.359	63.0	4 P	35.0	6:30 A	49.0	50.3	45.0	7.6
16	30.30	30.19	30.225	61.0	8 P	51.0	6 A	56.0	56.2	56.5	0.0
17	30.22	30.17	30.189	70.5	4 P	60.5	0 A	65.5	65.0	61.3	2.1
18	30.18	30.09	30.123	62.0	3 P	58.0	8 A	60.0	59.6	58.7	0.0
19	30.10	30.02	30.058	73.0	3 P	59 0	0 A	66.0	64.7	62.7	1.0
20	30.02	29 88	29.941	71.5	4 P	56.0	12 P	63.7	64.6	62.0	0.0
21	30.01	29.87	29.938	74.5	3 P	46.0	7 A	60.3	59.9	55.5	10.5
22	29 90	29.75	29 839	80.0	3 P	50.0	6 A	65.0	63.6	56.0	9.5
23	29.98	29.76	29 901	69.0	12 M	49.0	12 P	59.0	59.2	50.3	8.3
24	30.03	29.76	29.920	66.5	3:30 P	38.0	6:30 A	52.3	53.7	50.7	10.0
25	30.00	29.76	29.920	59.0	1:30 P	41.5	12 P	50.3	51.4	43.0	10.1
26	30.09	30.00	30.074	58.0	4 P	36.0	6:30 A	47.0	45.4	39.7	10.3
27	30.10	29.89	30.009	64.5	2:30 P	32.0	6:30 A	48.3	47.9	44.7	4.2
28	30.01	29.87	29.960	76.0	4 P	38.0	7:30 A	57.0	57.1	50.7	10.3
29	30.13	30 00	30.088	79.0	3 P	42.5	7 A	60.3	60.7	55.5	10.8
30	30.11	29.95	30.000	85.0	3:30 P	51.0	5 A	68.0	63.2	59.0	7.2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	54 5	.467	89.5	N.W.	4	0.0	—	—	2 P	2:30 P	T	
2	56.0	.477	97.0	S.W.	30	2.0	20	4 P	3 P	12 P	.53	
3	63.5	.608	96 0	S.E.	185	2.5	22	5 P	0 A	12 P	1.99	
4	65.0	.652	95.0	W.	49	2.5	22	2 P	0 A	2 P	1.98	
5	58.5	.560	86.5	W.S.W.	63	1.0	14	3 P				
6	56 0	.511	89.0	W.N.W.	43	2.0	20	1 P	12 M	2 P	.22	
7	53.5	.502	80.5	N.	76	2.5	22	5 P				
8	52.5	.507	77.5	N.	64	2.0	20	8 A				
9	52.5	.477	81.5	N.E.	29	0.0	—	—				
10	56.0	.518	87.5	S.W.	33	0.0	—	—				
11	56.0	.495	91.5	S.W.	94	2.5	22	9 P	5 P	12 P	.22	
12	61.0	.576	93.5	S.S.W.	141	0.5	10	9 A	0 A	3 P	.62	
13	49.5	.519	69.5	N.N.E.	134	7.0	37	6 P				
14	35.0	.330	64.0	N.N.E.	171	4.5	30	8 A				
15	40.5	.353	74.0	S.S.W.	95	1.5	17	7 P	7 P	10 P	T	
16	55.5	.486	91.0	S.	57	0.0	—	—	7 A	4 P	.03	
17	59.0	.603	83.5	S.	116	1.0	14	10 A	5 P	12 P	.07	
18	57.5	.506	95.5	S.S.E.	86	0.0	—	—	0 A	12 P	.40	
19	62.0	.592	96.0	N.	56	0.0	—	—	0 A	12 P	.07	
20	60.5	.595	89.5	S.	133	1.5	17	2 P	3 P	5 P	.13	
21	54.0	.475	88.5	S.W.	64	1.0	14	2 P				
22	53.5	.495	86.5	W.S.W.	89	1.0	14	12 M				
23	42.5	.488	57.0	N.W.	147	4.0	28	11 A				
24	48.5	.412	83.0	W.	93	1.5	17	10 A				
25	36 5	.343	63.5	N.N.W.	196	5.5	33	12 M				
26	32.0	.300	60.5	N.	38	2.0	20	2 P				
27	42.5	.333	86.0	W.S.W.	74	1.0	14	12 M				
28	48.5	.418	81.5	N.N.W.	41	2.0	20	2 P				
29	52.0	.522	75.5	S.S.W.	72	0.0	—	—				
30	57.5	.544	88.0	W.	54	0.5	10	10 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The same features that characterized the weather during August were the most prominent during September. The heavy rains of the last week of August were followed by a still greater precipitation during the first week in September; the total amount for the two weeks almost equaling eight inches. During the remainder of the month the precipitation was below the normal, none at all occurring during the last decade of the month. The total precipitation of the month was nearly ninety per cent more than the normal, making a September record exceeded only by that of 1889 since the establishment of this station.

The mean temperature was nearly two degrees below the normal. The maximum for the month was three degrees lower than usual and occurred on the last day. The minimum was practically normal. Light frosts were noted in the vicinity on several dates but practically no damage was done. The mean dew point was low and the relative hnmidity high.

The mean barometer was slightly lower than usual and the range about three-fourths of the usual amount. The total wind movement was about eighty per cent of the normal and but one gale was noted.

J. E. OSTRANDER. Meteorologist.

C. H. CHADWICK, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 202. OCTOBER, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.27, 29th, 9A.
Minimum reduced to freezing,	29.12, 12th, 3 A.
Reduced† maximum reading,	30.58, 29th, 9 A.
Reduced† minimum reading,	29.42, 12th, 3 A.
Mean semi-daily reduced,	30.101
Monthly range,	1.16

****Air Temperature.*** In Degrees Fahr.

Highest,	80.5, 9th, 4 P.
Lowest,	21.5, 30th, 7 A.
Mean hourly,	49.9
Mean of means of max. and min.,	50.0
Mean sensible (wet bulb),	44.2
Monthly range,	59.0
Highest mean daily,	64.7, 19th
Lowest mean daily,	35.3, 29th
Mean maximum,	62.3
Mean minimum,	37.7
Mean daily range,	24.6
Greatest daily range,	40.5, 8th
Least daily range,	6.0, 20th

Humidity.

Mean dew point,	40.3
Mean force of vapor,	.349
Mean relative humidity,	75.9

Precipitation. In inches.

Total precipitation,	2.27
Number of days on which .01 inch or more rain or melted snow fell,	6

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3397 m.
Greatest daily movement,	331 m., 21st
Least daily movement,	13 m., 30th
Mean daily movement,	109.6 m.
Mean hourly velocity,	4.6 m.
Maximum pressure per square foot, 9.0 lbs.= 43 m. per hour, 21st, 11 A., N.W.	
Prevailing Direction, West.	

Summary.

Northwest,	23 per cent.
South,	23 " "
South, Southwest,	10 " "
North, Northwest,	10 " "
Other directions,	34 " "

Weather.

Mean cloudiness observed,	36per cent.
Total cloudiness recorded by the Sun Thermometer,	132 hrs.=39 per cent.
Number of clear days,	13
Number of fair days,	11
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, 209 hrs.=61%

Rain, 3d, 11th, 12th, 19th, 20th, 24th, 28th.

Gales, 35 miles or more per hour, 35 m. 11th, E.S.E.; 43m. 21st N.W.

Frosts, 7th, 8th, 17th, 26th, 27th, 29th, 30th, 31st.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean, Semi daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.15	30.06	30.128	61.0	3:30 P	52.5	7 A	56.7	55.9	53.0	0.0
2	30.14	29.99	30.075	64.0	4 P	53.0	0 A	58.5	59.3	58.7	0.0
3	29 99	29.91	29.936	71.0	2 P	47.0	12 P	59.0	62.1	57.0	6.8
4	29.91	29.75	29.830	75.0	3 P	41.5	6 A	58.3	57.9	51.3	9.5
5	29.96	29.73	29.814	76.5	2:30 P	50.0	12 P	63.3	63.6	55.3	10.8
6	30.31	29 96	30.215	61.0	3 P	39.0	12 P	50.0	50.5	42.7	10.6
7	30.40	30.22	30 323	67.0	5 P	29.5	6:30 A	48.3	46.4	39.0	10.3
8	30.24	29.98	30.085	76.0	3:30 P	35.5	7 A	55.7	55.2	42.0	9.8
9	30.16	30.00	30.072	80.5	4 P	43.0	6:30 A	61.7	59.7	48.3	10.3
10	30.25	30.10	30.201	69.0	3:30 P	37.0	7 A	53.0	52.8	45.3	10.1
11	30.13	29.50	29.877	59 0	1 P	48.0	2 A	53.5	53.3	48.7	1.1
12	29.82	29.42	29.677	55.0	2:30 P	38.0	12 P	46.5	48.1	42.5	5.7
13	29.97	29.82	29 958	57.0	4 P	34.0	6 A	45.5	45.5	41.0	6 6
14	30.27	29.97	30.216	69.0	3:30 P	37.0	6 A	53.0	51.2	42.7	10 0
15	30.29	30.11	30.205	76.0	4 P	38.0	7 A	57.0	55.8	48.5	8.8
16	30.20	29.98	30.102	74.5	1:30 P	50.0	12 P	62.3	61.0	54.0	8.0
17	30.33	30.20	30.311	67.0	3:30 P	37.0	7 A	52.0	51.5	43.7	9.8
18	30.30	29.93	30.126	65.0	8 P	37.5	3 A	51.3	54.2	55.3.	0.8
19	29.98	29.87	29.952	73.0	1:30 P	58.0	12 P	65.5	64.7	61.5	3.6
20	29.87	29 53	29.708	62.0	5 P	56.0	7 A	59.0	57.0	52.3	0.0
21	30.03	29.74	29.939	48.5	1 P	33.0	12 P	40.7	42.7	35.3	8.6
22	30.04	29.93	30.009	50.5	2:30 P	30.0	7 A	40.3	40.5	37.5	6 6
23	30.11	29.98	30 059	52.5	3:30 P	32.0	5 A	42.3	39 8	35.0	7.0
24	30.14	30.01	30.096	60.0	2:30 P	31.5	7 A	45.7	46.4	43.3	6 3
25	30.24	30.08	30.177	52.0	2:30 P	34.0	12 P	43.0	45.1	38.0	7.0
26	30.33	30.21	30.296	48.0	3 P	24.0	7 A	36.0	35.9	31.3	9.5
27	30.27	30.16	30.234	52 0	3 P	23.0	6 A	37.5	38.2	34.0	8.0
28	30 44	30.20	30.347	50.5	3 P	31.0	12 P	40.7	42.6	38.0	0.0
29	30.58	30.44	30.538	48.5	4 P	24.5	7 A	36.5	35.3	29.5	9.3
30	30.54	30.38	30.444	55 0	5 P	21.5	7 A	38.3	35.7	29.5	9 0
31	30.38	29.96	30.185	55 0	3 P	24.0	7 A	39.5	39.0	36.0	5.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	52.0	.419	94.0	S.	19	0.5	10	8 A				
2	58.0	.449	94.5	S.	48	0.5	10	4 P				
3	56.0	.490	93 5	N.N.W.	112	4.5	30	11 A	0 A	6 A	.17	
4	48.5	.418	81.0	W.S.W.	66	2.0	20	1 P				
5	48.5	.590	58.5	W.	217	5.0	32	4 P				
6	34.5	.353	57.0	N.N.W.	140	4.5	30	3 P				
7	34.5	.273	73.5	S.	24	0.5	10	12 M				
8	41.5	.396	68.0	S.S.W.	125	1.0	14	5 P				
9	42.5	.414	67.5	N.N.E.	76	3.0	24	9 A				
10	40.0	.362	69.0	S.	60	1.5	17	7 P				
11	45.0	.398	76.5	S.E.	240	6.0	35	10 P	5 P	12 P	.20	
12	40.5	.292	87.0	W.N.W.	273	5.0	32	3 P	0 A	5:30 P	.73	
13	37.0	.293	74.0	W.S.W.	118	5.5	33	12 M				
14	39.0	.316	74.0	N.W.	54	1.5	17	12 M				
15	44.5	.418	73.0	S.	85	2.0	20	4 P				
16	49 5	.493	74.0	W.N.W.	182	4.0	28	12 M				
17	40.0	.325	76.0	S.	55	0.5	10	2 P				
18	53.5	.492	87.5	S.S.E.	148	4.5	30	7 P				
19	61.5	.578	92.0	S.S.W.	148	0.5	10	2 P	0 A	12 P	.45	
20	48.0	.454	75.5	W.	108	5.0	32	4 P	0 A	2 P	.70	
21	27.5	.246	62.0	N.W.	331	9.0	43	11 A				
22	32.5	.252	74.0	N.W.	45	0 5	10	2 P				
23	31.0	.220	80.0	N.W.	79	1.0	14	11 A				
24	40.5	.314	82.5	S.S.W.	91	2.0	20	2 P	5 P	10 P	.02	
25	33.0	.266	70.5	N.	113	1.0	14	11 A				
26	26.5	.195	74.0	E.	140	0.5	10	9 A				
27	27.5	.237	66.5	W.N.W.	54	0.5	10	1 P				
28	33.0	.264	72.0	S.	77	0.5	10	4 P	6 A	8 A	T	
29	25.0	.178	77.0	N.W.	83	1.0	14	9 A				
30	24.0	.183	70.0	N.W.	13	0.0	—	—				
31	33.0	.245	81.0	N.W.	73	0.5	10	11 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during October was unusually pleasant and in many respects proved to be the most agreeable period of the year. The absence of extremes of temperature, the large number of bright, sunshiny days, the small rainfall, all combined in producing a most favorable result. The progress of the season was however very noticeable; the temperature falling below the freezing point nearly every night during the last week of the month.

The mean barometer was considerably higher than the normal and the range slightly more than usual. The total wind movement was a little more than 80 per cent of the normal and but two gales were noted.

The temperature was practically normal, the maximum about two degrees higher than usual and the minimum more than a degree lower than usual, giving a rather large range.

The mean dew point was slightly higher and the relative humidity a little lower than the average.

The precipitation for the month was about 60 per cent of the usual amount and nearly all of it fell during two storms. But seven cloudy days were observed during the month.

The first heavy frost of the season occurred on the morning of the 7th, and thin ice was formed on the 28th.

J. E. OSTRANDER. Meteorologist.

C. H. CHADWICK, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 203. NOVEMBER, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.31, 30th, 12 P.
Minimum reduced to freezing,	29.11, 13th, 2 P.
Reduced† maximum reading,	30.63, 30th, 12 P.
Reduced† minimum reading,	29.41, 13th, 2 P.
Mean semi-daily reduced,	30.009
Monthly range,	1.22

****Air Temperature.*** In Degrees Fahr.

Highest,	61.0, 1st, 3 P.
Lowest,	11.0, 14th, 7.30 A.
Mean hourly,	36.3
Mean of means of max. and min.,	36.5
Mean sensible (wet bulb),	32.1
Monthly range,	50.0
Highest mean daily,	46.2, 24th
Lowest mean daily,	21.3, 14th
Mean maximum,	47.5
Mean minimum,	25.6
Mean daily range,	21.9
Greatest daily range,	33.0, 13th, 22d
Least daily range,	9.0, 6th

Humidity.

Mean dew point,	26.8
Mean force of vapor,	.211
Mean relative humidity,	73.5

Precipitation. In inches.

Total precipitation,	2.06
Number of days on which .01 inch or more rain or melted snow fell,	7

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4317 m.
Greatest daily movement,	406 m., 30th
Least daily movement,	16 m., 26th
Mean daily movement,	143.9 m.
Mean hourly velocity,	6.0 m.

Maximum pressure per square foot, 9.0 lbs.= 43 m. per hour, 29th, 10 P., S.S.W.

Prevailing Direction, West, Northwest.

Summary.

Northwest,	17 per cent.
West, Northwest,	20 " "
West, Southwest,	10 " "
South, Southeast,	17 " "
North, Northwest,	10 " "
Other directions,	26 " "

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	137 hrs.=47 per cent.
Number of clear days,	8
Number of fair days,	13
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, 156 hrs.=53%

Rain, 3d, 4th, 6th, 8th, 13th, 15th, 26th, 28th, 29th.

Gales, 35 miles or more per hour, 35 m. 13th, N.N.W.; 35m. 17th, W.N.W.; 35m., 21st, N.N.E.; 43 m. 29th, S.S.W.; 41 m. 30th, W.N.W.

Snow, 9th, 28th, 30th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.96	29.55	29.780	61.0	3 P	33.0	12 P	47.0	45.5	38.0	4.6
2	30.26	29.89	30.158	45.0	4 P	26.0	12 P	35.5	34.7	28.3	8.1
3	30.28	30.02	30.168	48.5	3 P	19.5	7 A	34.0	35.0	32.0	5.6
4	30.24	29.98	30.074	51.5	3 P	34.0	12 P	42.7	42.8	39.0	4.5
5	30.33	30.17	30.264	55.0	3 P	27.0	7 A	41.0	40.9	35.7	7.8
6	30.17	29.62	29.778	45.5	2 P	36.5	7 A	41.0	38.6	37.5	0.0
7	29.77	29.71	29.764	48.0	3:30 P	36.0	7 A	42.0	41.3	37.3	4.8
8	29.85	29.69	29.760	43.5	5 P	32.5	6 A	38.0	36.2	34.0	0.0
9	30.06	29.85	29.979	44.5	4 P	28.0	7:30 A	36.3	33.5	29.5	3.0
10	30.32	30.06	30.243	43.0	3 P	24.0	7:30 A	33.5	33.3	30.0	7.3
11	30.32	29.99	30.172	44.0	2 P	22.0	7:30 A	33.0	32.9	29.5	3.8
12	29.99	29.59	29.762	59.0	3 P	29.0	7:30 A	44.0	42.8	36.3	8.0
13	29.79	29.41	29.574	52.0	3 P	19.0	12 P	35.5	41.0	34.7	2.0
14	30.05	29.79	30.023	31.5	3 P	11.0	7:30 A	21.3	21.3	16.5	8.7
15	30.05	29.61	29.825	42.0	8 P	13.5	7:30 A	27.7	28.8	28.3	2.5
16	29.61	29.44	29.529	47.0	3 P	33.5	7:30 A	40.3	38.2	35.3	2.0
17	29.78	29.55	29.720	42.0	2 P	32.0	0 A	37.0	36.3	31.5	6.1
18	30.00	29.74	29.910	45.0	2:30 P	28.0	7 A	36.5	34.7	30.7	7.3
19	30.23	30.00	30.139	46.5	2:30 P	23.5	7:30 A	35.0	32.2	26.0	9.0
20	30.48	30.23	30.427	38.0	4 P	17.5	7 A	27.7	27.5	21.7	9.0
21	30.58	30.48	30.551	48.0	3 P	22.0	7:30 A	35.0	33.7	28.3	8.9
22	30.51	30.22	30.349	50.5	4 P	17.5	7 A	34.0	33.6	27.5	5.0
23	30.24	30.15	30.200	55.5	3 P	29.5	7:30 A	42.5	42.8	38.0	7.3
24	30.17	29.88	30.035	60.5	3 P	30.0	7 A	45.3	46.2	40.5	7.2
25	29.95	29.78	29.872	55.0	2 P	29.0	12 P	42.0	45.7	40.5	6.6
26	29.98	29.82	29.921	44.0	3 P	21.5	7:30 A	32.7	33.7	30.7	4.8
27	30.36	29.85	30.172	43.0	2 P	28.0	12 P	35.5	36.1	33.0	6.1
28	30.46	30.04	30.310	35.0	3 P	20.0	7:30 A	27.5	29.0	27.0	1.1
29	30.04	29.48	29.623	57.5	3 P	31.0	0 A	44.3	45.7	48.3	0.0
30	30.63	29.67	30.205	43.0	0 A	13.0	12 P	28.0	26.2	18.3	5.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	32.0	.267	72.0	W.	180	5.5	33	6 P				
2	20.5	.181	63.5	W.S.W.	216	3.0	24	9 A				
3	27.5	.218	75.0	S.S.E.	84	2.0	20	1 P	6 P	12 P	.03	
4	35.5	.258	82.0	N.N.W.	136	2.5	22	1 P	0 A	5 A	.32	
5	30.5	.236	74 5	W.	29	1.0	14	9 A				
6	36.5	.231	94.0	S.S.E.	44	4.0	28	10 P	1 A	8 P	.44	
7	32.0	.256	70.5	N.W.	121	1.0	14	3 A				
8	30.5	.213	80.0	N.W.	34	1.0	14	3 P	6 A	3 P	.04	
9	27.0	.173	85.0	W.N.W.	137	2.0	20	4 P	12 M	6 P		T
10	26.0	.184	75.5	N.N.W.	103	1.0	14	2 P				
11	24.0	.192	70.0	S.S.E.	91	0.5	10	3 P				
12	32.0	.242	75.5	W.S.W.	146	3.0	24	12 M				
13	28 5	.236	69.5	W.N.W.	224	6.0	35	11 P	8 A	11 A	T	
14	11.0	.102	72.0	N.N.W.	150	0.5	10	2 P				
15	25.5	.182	81.5	S.	186	4.5	30	1 P	5 P	12 P	.03	
16	33.5	.217	87.0	S.S.W.	83	0.0	—	—				
17	26.5	.199	72.0	W.N.W.	201	6.0	35	10 A				
18	26.0	.190	73.5	N.W.	116	4.0	28	1 P				
19	16.0	.167	55.5	N.	98	2.0	20	4 P				
20	10.0	.141	52.5	N.	182	4.0	28	9 A				
21	21.5	.175	70.0	N.N.E.	295	6.0	35	1 P				
22	19 0	.188	60.0	W.N.W.	45	0.0	—	—				
23	32.5	.268	71.0	W.S.W.	146	2.0	20	4 P				
24	36.5	.292	77.0	S.S.W.	174	4.0	28	5 P				
25	35 5	.288	76.5	W.N.W.	261	2.0	20	2 P				
26	26.0	.196	75.5	N.W.	16	1.0	14	6 P	9 P	12 P	T	
27	28.5	.214	73.0	W.N.W.	183	3.0	24	9 A				
28	23.0	.160	80.0	S.S.E.	48	0.5	10	10 A	2:30 P	12 P	.20	½
29	46.5	.356	89 5	S.S.E.	182	9.0	43	10 P	0 A	10 P	1.00	
30	6.5	.123	52.0	N.W.	406	8 5	41	6 A	6 A	12 M		T

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during November was generally pleasant and more agreeable than usual for the time of year. The predominating features of the previous month continued to be the most prominent this month. While the mean temperature was below the normal the large amount of sunshine tended to offset it in making the daytime pleasant.

The mean barometer was slightly lower than usual and the range not as much as the average for November. The fluctuations were generally large, however, and extended over periods of several days. The fall and rise at the end of the month, accompanying the only pronounced storm that occurred, were unusually rapid, the rise especially so, being almost an inch on the 30th.

The total wind movement was slightly more than normal; on the 30th more than 400 miles being noted accompanying the rapid rise of the barometer.

The mean temperature was about a degree below the normal and the maximum nearly five degrees lower than usual. The minimum being nearly normal the range was correspondingly small. The mean dew point and relative humidity were both considerably lower than usual.

The total precipitation was about 60 per cent of the normal and more than half of it occurred during the storm near the close of the month. The small precipitation record of last month in connection with the record for this month has left the ground unusually dry for the advent of winter.

The amount of sunshine was considerably greater than usual.

J. E. OSTRANDER. Meteorologist.

C. H. CHADWICK, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 204. DECEMBER, 1905.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.54, 1st, 11 A.
Minimum reduced to freezing,	29.03, 29th, 5 P.
Reduced† maximum reading,	30.86, 1st, 11 A.
Reduced† minimum reading,	29.33, 29th, 5 P.
Mean semi-daily reduced,	30.078
Monthly range,	1.53

****Air Temperature.*** In Degrees Fahr.

Highest,	54.5, 8th, 3 P.
Lowest,	3.0, 11th, 5 A.
Mean hourly,	29.8
Mean of means of max. and min.,	30.1
Mean sensible (wet bulb),	26.9
Monthly range,	51.5
Highest mean daily,	44.3, 3d
Lowest mean daily,	11.8, 15th
Mean maximum,	38.9
Mean minimum,	21.3
Mean daily range,	17.6
Greatest daily range,	31.5, 18th
Least daily range,	6.0, 30th

Humidity.

Mean dew point,	23.8
Mean force of vapor,	.165
Mean relative humidity,	80.6

Precipitation. In inches.

Total precipitation,	3.15
Number of days on which .01 inch or more rain or melted snow fell,	8
Total snow in inches,	2½
Snow on ground at end of month,	none

Wind.

Total movement,	4051 m.
Greatest daily movement,	320 m., 19th
Least daily movement,	6 m., 19th
Mean daily movement,	131 m.
Mean hourly velocity,	5.5 m.

Maximum pressure per square foot, 14.0 lbs.= 53 m. per hour, 30th, 11 A., W.

Prevailing Direction, Northwest.

Summary.

Northwest,	17 per cent.
West, Northwest,	10 " "
South, Southwest,	10 " "
Southeast,	10 " "
East,	13 " "
North, Northeast,	10 " "
Other directions,	31 " "

Weather.

Mean cloudiness observed,	56 per cent.
Total cloudiness recorded by the Sun Thermometer,	155 hrs.=55 per cent.
Number of clear days,	10
Number of fair days,	8
Number of cloudy days,	13

Bright Sunshine.

Number of hours recorded,	128 hrs.=45%

Rain, 2d, 3d, 20th, 21st, 22d, 23d, 29th.

Gales, 35 miles or more per hour, 35 m. 10th, N.W.; 35m. 24th, W.N.W.; 53m., 30th, W.

Snow, 2d, 9th, 10th, 11th, 30th.

Days of Sleighing,	2

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.86	30.63	30.816	35.0	4 P	9.5	7:30 A	22.3	20.5	14.7	8.3
2	30.82	30.15	30.438	47.0	12 P	15.0	4 A	31.0	28.4	32.3	0.0
3	30.15	29.59	29.762	52.0	6 A	34.0	12 P	43.0	44.3	43.3	0.0
4	30.20	29.73	30.038	34.0	0 A	25.0	12 P	29.5	30.2	26.0	4.1
5	30.50	30.20	30.483	32.5	3 P	17.0	7:30 A	24.7	25.5	20.5	7.3
6	30.46	30.24	30.357	38.0	10 P	22.0	7:30 A	30.0	30.1	28.0	0.3
7	30.29	30.22	30.268	44.0	3 P	30.0	12 P	37.0	35.9	32.3	3.8
8	30.38	30.21	30.257	54.5	3 P	28.0	4 A	41.3	38.2	33.7	7.5
9	30.40	29.95	30.248	37.0	12 M	27.5	5 A	32.3	31.7	31.3	1.0
10	29.95	29.41	29.603	36.0	3 P	13.0	12 P	24.5	26.8	22.3	3.0
11	29.75	29.63	29.715	26.0	12 P	3.0	5 A	14.5	18.0	18.5	2.0
12	29.86	29.74	29.849	35.5	2 P	26.0	0 A	30.7	31.0	29.0	4.0
13	30.16	29.85	30.047	43.0	2 P	27.0	7 A	35.0	33.2	29.7	5.5
14	30.54	30.16	30.384	31.5	2:30 P	15.0	12 P	23.3	26.9	21.3	8.0
15	30.61	30.46	30.542	15.0	5 P	5.5	7:30 A	10.3	11.8	9.3	3.2
16	30.49	30.24	30.347	29.0	4 P	10.0	5 A	19.5	17.2	13.3	5.0
17	30.24	30.02	30.115	39.5	4 P	9.0	6 A	24.3	23.4	20.0	7.6
18	30.02	29.84	29.926	39.5	4 P	8.0	7:30 A	23.7	22.4	16.7	7.5
19	30.16	29.95	30.120	37.0	4 P	20.5	7:30 A	28.7	29.4	26.5	4.0
20	30.37	30.16	30.351	45.0	3:30 P	23.5	7 A	34.3	32.8	28.0	5.7
21	30.33	29.62	29.821	42.5	2:30 P	30.0	1 A	36.3	36.5	35.5	0.0
22	29.93	29.64	29.853	45.0	3 P	35.0	0 A	40.0	40.5	38.3	0.1
23	29.94	29.64	29.772	35.0	4 P	28.5	10 P	31.7	33.1	31.7	0.0
24	30.02	29.71	29.878	34.0	1 P	27.0	12 P	30.5	31.0	27.3	5.0
25	30.05	29.95	30.028	36.0	4:30 P	18.5	7:30 A	27.3	25.5	22.0	5.8
26	30.12	30.03	30.082	39.0	4 P	21.0	4:30 A	30.0	28.5	24.5	8.0
27	30.14	30.02	30.108	49.0	3:30 P	25.0	7 A	37.0	33.9	29.0	7.0
28	30.26	30.07	30.201	47.5	4 P	19.0	7:30 A	33.3	28.8	24.0	7.0
29	30.07	29.33	29.463	47.0	4 P	27.0	3 A	37.0	38.4	38.7	0.0
30	29.77	29.35	29 543	39.0	2 P	33.0	7 P	36.0	36.5	34.3	0.0
31	30.02	29.76	29.998	40.0	2 P	29.0	12 P	34.5	34.7	30.5	7.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	7.5	.097	67.5	E.N.E.	65	1.0	14	3 A				
2	28.0	.214	80.0	S.S.W.	39	2.0	20	8 P	9 A	12 P	.01	T
3	42.5	.290	94.5	N.	200	4.5	30	5 P	0 A	12 P	1.25	
4	20.5	.157	72.5	N.W.	235	5.5	33	12 M				
5	14.0	.124	70 0	N.W.	211	3.5	26	12 M				
6	24.5	.168	81.0	W.S.W.	94	0.5	10	8 P				
7	27.5	.202	76.5	N.W.	155	3.0	24	2 P				
8	30.5	.210	80.0	N.N.E.	105	0.5	10	8 P				
9	28.5	.187	82.5	N.N.E.	130	1.0	14	5 P	11 P	12 P	*	*
10	17.5	.133	77.0	N.N.W	320	6.0	35	5 P	0 A	4 P	.44	2½
11	15.5	.110	85.0	S.E.	83	0.0	—	—	6 A	11 A		T
12	27.0	.166	90.0	E.S.E.	130	0.0	—	—				
13	24.5	.185	77.5	S.S.W.	37	0.0	—	—				
14	16.0	.127	72.0	W.N.W.	150	3.0	24	11 P				
15	4.0	.074	75.5	N.N.W.	280	5.0	32	4 A				
16	6.5	.091	69.0	N.	181	1.5	17	11 A				
17	17.5	.117	88.5	N.N.E.	95	0.0	—	—				
18	13.0	.106	81.0	E.	8	0.0	—	—				
19	24.0	.157	83.5	E.	6	0.0	—	—				
20	26.0	.163	89.0	E.	17	0.0	—	—	10 P	12 P	.12	
21	34.5	.214	91.0	E.	151	4.0	28	7 A	0 A	12 P	.65	
22	34.5	.257	78.5	W.	132	3.5	26	3 P	0 A	10 A	T	
23	29.5	.185	90.0	E.	93	1.0	14	1 A	6 A	7 P	.12	
24	21.5	.165	73.5	W.N.W.	194	6.0	35	12 M				
25	19.0	.127	84.0	S.E.	79	0.0	—	—				
26	18.0	.149	70.0	S.S.W.	113	1.0	14	2 P				
27	24.5	.172	81.5	S.	147	0.5	10	12 M				
28	20.5	.140	84.5	S.E.	15	0.0	—	—				
29	36.0	.250	86.0	N.W.	33	0.0	—	—	3 A	8 P	.56	
30	31.5	.211	84.0	W.	317	14.0	53	11 A	2 P	7 P		T
31	27.5	.180	83.0	N.W.	236	4.0	30	1 A				

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1905.

Pressure. In inches.

Maximum reduced to freezing, ... 30.54, Dec. 1, 11 A.
Minimum reduced to freezing, ... 28.91, Apr. 6th, 10 A.
Maximum reduced to freezing and sea-level, ... 30.86, Dec. 1, 11 A.
Minimum reduced to freezing and sea-level, ... 29.22, Apr. 6th, 10 A.
Mean reduced to freezing and sea-level, ... 30.019
Annual range, ... 1.64

****Air Temperature.*** In degrees Fahr.

Highest, ... 93.0, July 10th, 2:30 P.
Lowest, ... —13.0, Jan. 24th, 7:30 A.
Mean, ... 45.8
Mean of means of max. and min., ... 46.1
Mean sensible (wet bulb), ... 41.1
Annual range, ... 106.0
Highest mean daily, ... 81.5, July 18th.
Lowest mean daily, ... 1.7, Jan. 5th.
Mean maximum, ... 57.1
Mean minimum, ... 35.0
Mean daily range, ... 22.1
Greatest daily range, ... 45.0, Juue 9th
Least daily range, ... 3.0, Jnne 12th.

Humidity.

Mean dew point, ... 37.3
Mean force of vapor, ...365
Mean relative humidity, ... 76.5

Wind.

Prevailing direction, ... West

Summary.

West, Northwest, ... 13 per cent.
South, Southwest, ... 11 " "
South, ... 10 " "
Northwest, ... 9 " "
West, ... 8 " "
Other directions, ... 49 " "
Total movement, ... 46,442 m.
Greatest daily movement, . . . 475 m., Jan. 4th.
Least daily movement, ... 1 m., June 22d.
Mean daily movement, ... 127 m.
Mean hourly velocity, ... 5.3 m.

*Temperature in ground shelter.

C. H. CHADWICK,
Observer.

Maximum pressure per square foot, 23.5 lbs.=69 m. per hour, Jan. 4th, 9 A., W.N.W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 38.80
Number of days on which .01 or more rain or melted snow fell, ... 122
Snow total in inches, ... 40.0

Weather.

Mean cloudiness observed, ... 49 per cent.
Total cloudiness recorded by Sun Thermometer, ... 1977 hrs.=44 per cent.
Number of clear days, ... 130
Number of fair days, ... 128
Number of cloudy days, ... 107

Bright Sunshine.

Number of hours recorded, 2477 hrs.=56 per cent.

Dates of Frosts.

Last, ... May 24th
First, ... Sept. 15th

Dates of Snow.

Last, ... May 1st
First, ... Nov. 9th
Total days of sleighing, ... 64

Gales of 50 or More Miles Per Hour.

Jan. 4th, 69 m., N.N.W.; 7th, 52 m., E.S.E.; 25th, 60 m., N.N.W.; 26th, 50 m., N.W.
Feb. 18th, 60 m., W.
Mar. 19, 57 m., N.E.
Apr. 17, 60 m., W.
Dec. 30, 53 m., W.

J. E. OSTRANDER,
Meteorologist.